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THE price of pig lead in this market has reached the importing figure. Consequently orders have been sent to London for from between 2,000 and 3,000 tons. The market on the other side only required this additional demand to raise its price to £14 per ton, and without a further advance in the price here no further importations can take place from that quarter. Although this is at present the case, it does not apply to other countries, and were the smelting works now under construction in Mexico in operation we should be importing pig lead from that country in place of fluxing ores.

The question naturally arises, By which is this country most benefited —by the importation of pig lead or the importation of fluxing ores, which are necessary for the proper development of our dry-ore mines and by the use of which we have the advantage to labor and the profit to capital in the manufacture of the pig lead? From an economic standpoint there is no doubt as to which is more beneficial to the country.

THE second stage of the Annapolis trial of armor plates resulted in still further establishing the superiority of the nickel-steel alloy for such defensive work. The tensile strength of the nickel-steel plate was such that though penetrated by the shots no cracks were developed in the plate. The all-steel plate was divided into quarters by four cracks running from the centre hole to the holes made near the four corners and thence to the outside of the plate. The Cammell compound plate may be said to have been entirely broken up. The nickel-steel alloy, of which the plate was composed, is said to contain less than four per cent. of nickel.

The question of a market for a largely increased production of nickel which was so much questioned last year and which we mantained was simply a question of price in connection with its application as an alloy wirth steel may be said to be definitely settled by these trials, as in addition to the European demand to which we alluded at the time (December 21, 1889), a bill was introduced yesterday, and immediately passed, by the House of Representatives, at Washington, appropriating $1,000,000 to enable the Secretary of the Navy to buy nickel ore and nickel matte for use in the production of steel armor for the new armored cruisers.

WELCOME TO OUR GUESTS.

"Welcome to America, British and German iron masters, welcome, welcome!" is the heartfelt wish of every American. The warmth of this welcome our guests will recognize and appreciate during their visit, and we trust they will everywhere find themselves so much "at home" with us that they will see no boundary lines to separate us professionally in the future.

Every American recognizes and admires the magnificent qualities which have given the little island-kingdom the political control of a very large part of the habitable globe and the commercial control of the world's markets. This glorious position has been won by British miners and metallurgists, and well, indeed, may their countrymen be proud of their achievements. The whole world owes them gratitude, for have they not laid the foundations of liberty which have brought blessings on many nations, and have they not forged the abiding links of modern civilization in their triumphs of engineering?

Welcome, then, to the men who make nations free and prosperous, who lay the foundations of civilization and lead the way on the paths of progress. Nor are we unmindful of the marvelous progress made by German engineers—those great pioneers in mining and metallurgy—and of the triumphs they have achieved; we give an equal welcome to their worthy representatives now with us.

Our guests will find Americans everywhere ready to give them information, to exchange with them experiences, and to show them what we are doing and how we do it. It is not necessary to urge our people to this; it is their custom, and they will in this case merely do it with increased warmth and good feeling.

THE SILVER MARKET.

The reaction in the market price of silver from 120¾, the highest point touched since the passing of the Silver Bill, to 112¼, its present figure, naturally calls attention to the statistical position of the metal. This movement in price also causes some anxiety to those who are really interested in maintaining the value of the metal steadily at a higher level than has been the case for some years past. Interference with the market price of any product by means of legislation is always a dangerous experiment, and in this case it will be an unsatisfactory one if, in place of giving a stable higher value to silver, it should convert silver into one of the most speculative articles on the stock list.

The extent of the fluctuations in price within the last few months has been 35 per cent., and we doubt whether such a movement has been equaled within the same time by any other leading commodity, Sugar-trust certificates scarcely excepted. The rapid advance in price was altogether and the subsequent reaction was in great part due to the policy of the Treasury in its interpretation of the act; but now that this may be assumed to be settled, we may fairly expect a steadier price, whatever the ultimate level may be.

The statistical position of the metal appears less satisfactory to those who are still looking for an advance in silver than it is in reality, and no doubt this has influenced speculators and assisted in the reaction; but a careful examination over a somewhat wider field will lead to a conclusion different from that arrived at by those who take a "bearish" view of the market.

It has been pointed out that in the two months of July and August the total exports of silver were $4,924,096, and the total imports $3,156,875, leaving net exports $1,767,821, against net exports in the corresponding two months of last year of $3,561,115. Considering that Europe not only abstained from her usual purchases in this country, but, contrary to her custom, exported the metal to us on balance since the date that silver legislation became a probability, the fore going figures would indicate but a slight prospect of reduction of

the accumulation of silver here. If we go back to the month of May, when the anticipated legislation began to make itself really felt, we find that for the four months ending August 31st the net *import* of silver amounted to $1,279,504, while for the corresponding four months of last year the net *export* was $7,926,643. This difference, then, of $9,206,147, representing more or less the accumulation hanging on the market, is what damps the speculators' ardor during the present temporary suspension of Treasury purchases. It must, however, be remembered that the purchases of the Treasury, owing to the adjustment of the date from which to calculate the operation of the law, have only amounted to about 3,500,000 ounces for the current month, and that from October 1st this will be increased to 4,500,000 ounces monthly.

Taking the silver certificates as fairly representing the visible stock of silver in the New York market, we find that this increased steadily up to September 10th, when the amount for one day exceeded 8,000,000 ounces. From that day forward, however, there has been as steady a decline, so that to-day, the 26th, the stock is reported at less than 7,100.000 ounces—this during a period of 16 days when, as already noted, the government purchases were considerably below what will hereafter be the monthly amount. We should also not lose sight of the fact that the shipments to the East from London have shown no signs of diminution during the rise in price, but have rather increased, a feature which has characterized that market during the past two years. This has resulted, taken in conjunction with the loss of supply from this country, in reducing the stock of silver in London since April 1st of this year by nearly 7,000,000 ounces, and unless London shows more vigor in buying, it looks as though the accumulated supply of silver bullion of the world will be held in New York in place of in London, as has hitherto been the case.

In connection with this part of the question, and the change of temper on the part of the speculators, we cannot help attributing the latter partly to the importation of foreign silver coin for the purpose of melting and sale, mentioned in the silver market report of the ENGINEERING AND MINING JOURNAL of September 6th.

HOW COMSTOCK STOCKHOLDERS ARE SWINDLED.

The discovery of the bonanzas of the great Comstock lode of Nevada was not an unalloyed blessing. It is true that the marvelous richness of the unparalleled deposit, developed and worked with characteristic American energy and ingenuity, greatly stimulated the search for mineral veins and the exploitation of mines in every part of this country, if not in the world, and it is also true that the bold and successful manner in which difficult problems were there worked out proved an extremely valuable and encouraging lesson to the industry of mining and metallurgy then in its infancy in this country. Too much praise can scarcely be given to the enterprise, perseverance and skill shown by the great pioneers of the West for their work since the discovery of gold in California in "'49" to the present time. The "strike" of the Comstock bonanzas was one of those incidents which greatly fostered and royally rewarded these admirable qualities.

Unfortunately, there is another side to this story. The wild stock speculation which accompanied the great bonanza period of the Comstock not only diverted attention from the development of the natural and permanent resources—other than mining—of California, and set back for many years the industrial growth of the State, but it converted for the time the whole community, men, women, and children, into a race of gamblers, to the infinite injury of the country. Honesty, honor, virtue were forgotten in the gambling craze which accompanied the exploitation of these vast treasures. It was, perhaps, natural that such an environment, and such opportunities, should have led also to a phenomenal development of rascality, and such, indeed, has been the case.

Almost from the first "Comstock mine management" has been a synonym for sharp practices, swindling of various kinds, and even bold and open robbery practiced upon the stockholders of the mines. To such a length has this gone that for many years the constant advice given by the ENGINEERING AND MINING JOURNAL to its readers has been, "Leave Comstock shares alone, for, whether the mines be rich or poor, the management being dishonest will absorb all the profits and divert the assessments. The avoidable risks of mining investments are quite great enough without adding to them dishonest management. Leave Comstocks alone." This disinterested advice, we have reason to know, has been followed by many of our readers, but nevertheless Comstock shares have found a market, for the most part on the Pacific coast, and the victims of Comstock mine and mill management are to be counted by the thousand. Some of these merit little sympathy. They are men who, when they had the opportunity, were no better than those who now manage the mines and mills. They may not have diverted as much or as boldly as those whom long practice and success have rendered skillful in robbery, but they went as far as their opportunities permitted. There are, however, many innocent and honest stockholders in the Comstocks, whose cause calls loudly for justice, and during a recent visit through the West we were requested by many of these to again take up their cause, for they believe that the disinterested support of the ENGINEERING AND MINING JOURNAL will secure the co-operation of those who could not otherwise be reached. Upon careful investigation of the facts we are convinced that the time is propitious, and we now cordially invite the assistance of all stockholders or others who can contribute facts or evidence for our assistance, and of those who sympathize with our effort to cleanse this the foulest blot that has ever disgraced mining in this country, and that has made "Comstock management" a stench in the nostrils of honest men.

It is true there is nothing new in the fact that the mine stockholders are being systematically swindled by the Comstock mill ring. This, indeed, is a very old and familiar story, and since we have again and again stated the facts without inspiring any serious effort to bring the guilty to justice, we might not now have commenced a campaign for the same end were it not that evidence then lacking is now available, and there seems now to be a possibility of righting these long-standing wrongs.

We well know the herculean character of this undertaking, but we believe the time is ripe and that our efforts will not only find numerous and warm supporters among the stockholders, but that united efforts may now effect the recovery of a portion of what has been taken. We shall in subsequent issues enter into particulars of how the Comstock mines and mills are managed, and of the locality and extent of the "leaks" therein.

NEW PUBLICATIONS

Messrs. Julius Bien & Co., of this city, are preparing for early publication "The Atlas of the Metropolitan District," a series of maps of New York and adjacent country within 50 miles of New York, on a large scale, made from new and original surveys for this publication, engraved on copper and printed in colors, and giving all the details of the topography, hydrography, and economic features of that section of the country.

The results of the new census for the territory covered by the maps will be plotted or otherwise presented in this large volume, size, 17½ × 23 inches.

TRUSSES AND ARCHES ANALYZED AND DISCUSSED BY GRAPHICAL METHODS. By Charles E. Greene, C. E., Professor of Civil Engineering in University of Michigan. In three parts. Part I., Roof Trusses. Revised edition. 80 pages, with three folding plates. New York: John Wiley & Sons. Price $1.25.

The author states that his aim is to explain and illustrate a simple method for finding the stresses in all of the pieces of such roofs or other trusses, under the action of a steady load, as permit of an exact analysis; to show how the wind or any oblique force alters the amount of the stress arising from the weight; to add a device for solving some systems of trussing which otherwise appear insoluble by the above method; and to conclude with such an explanation of bending moments and moments of resistance as will make this part reasonably complete for roof designing. The work is a model of clear and concise writing, and ably sustains the reputation of the author as a writer on engineering topics.

ELECTRO-CHEMICAL ANALYSES. By Edgar F. Smith, Professor of Analytical Chemistry in the University of Pennsylvania. 25 illustrations, 12mo, 116 pages. Philadelphia. P. Blakiston, Son & Co. Price, $1.

This is a handy little volume on the method of quantitative analysis by electrolysis, a method which is omitted in the larger works on analytical chemistry. The plan adopted by the author is to give a brief introduc, tion upon the behavior of the current toward the different acids and salts-a short description of the various sources of the electric energy; its control and measurement, after which follow a condensed history of the introduction of the current into chemical analysis, and sections relating to the determination and separation of metals, as well as the oxidations possible by means of the electric agent.

The methods of determination and separation given preference, are not those of any one individual, but have been selected from all sources after an experience of many years, care being taken to present only those which actual tests have shown to be reliable and trustworthy.

PRACTICAL BLACKSMITHING.—A collection of articles contributed at different times by skilled workmen in the columns of *The Blacksmith and Wheelwright*, compiled and edited by M. T. Richardson, editor of *The Blacksmith and Wheelwright*. Illustrated. Vol. III. Price, $1. M. T. Richardson, Publisher, New York.

In Vol. 1 of this series the editor gave a brief account of the early history of blacksmithing and described many ancient and modern tools, with numerous plans of shops and the best methods of building chimneys and constructing forges.

In Vol. II a brief treatise on iron was given, together with illustrations and descriptions of bolt and rivet clippers, chisels, drills, swages and a large number of special blacksmiths' tools.

In the volume before us is continued the making of blacksmiths' tools, with illustrations and descriptions. The subjects treated are: Wrenches, with illustrations for their use; welding, brazing and soldering; the various uses of steel; tempering, hardening, testing, etc; hand forgings, the making of chain swivels, and plow work. The book contains 316 pages and nearly 400 illustrations. It would seem to be of great value to every blacksmith. Vol. IV., the editor announces, will complete the topic of blacksmiths' tools, and also complete the series.

HEAT: SCIENCE AND PHILOSOPHY OF ITS PRODUCTION AND APPLICATION TO THE WARMING AND VENTILATION OF BUILDINGS, THE ABSORBING AND TRANSMITTING POWER OF DIFFERENT BOILER AND RADIATOR SURFACES WITH STEAM AND WATER CIRCULATION. VENTILATION BY FANS AND WATER MOTORS WITH HYDRANT PRESSURE. ALSO PLANS, TABLES AND DIAGRAMS OF EXPERIMENTAL WORK, AND RESULTS OF ACTUAL CONSTRUCTION. By John H. Mills. 2 volumes, 600 pages. Published by the author, Boston, Mass. Price, $12.

The two handsomely printed and bound volumes the extensive title of which is given above are inscribed by the author to architects and builders, to engineers and contractors of steam and hot water apparatus, to teachers,

superintendents of public builders and to all interested in the generation and application of heat.

Of the making of books on heat there is no end. We have frequently found fault with the professional bookmakers for their rehashing old knowledge concerning heat and its applications, and printing books which are no better than their predecessors, and have as frequently complained that the practical men, who have the most recent actual knowledge at their fingers' ends, do not write books to tell us their experience. Mr. Mills has answered the latter complaint. He is a practical man, having spent the greater part of his life in manufacturing heating apparatus, and he now, as he tells us in his preface, has desisted from contracts and other remunerative labor for two years in order to collect and arrange the record of his own and the reported work of other engineers. He attempts to disarm criticism by his disavowal of literary ability as follows:

A mechanic by trade, an amateur in the sciences, without the advantages of a liberal education, and constrained to daily labor, may not hope to add to his other records originality of theme, the grace and polish of a scholar, or the accuracy of a mathematician. It is not, therefore, in a literary line or as a teacher of the sciences that the author expects approval, etc.

His friends, he says, have often and kindly urged him to put his studies, experiments and constructions in some connected and readable form.

If the author had gone no further than to follow this good advice, he would have published a book of a less size than one of his two volumes, and we would have been glad to welcome such a book as a valuable addition to our knowledge on the subject of heating and ventilation, for a great deal of what he gives is both new and valuable, and is presented in excellent shape; but, unfortunately, he has padded out the work with a mass of writing on fuel, theory of combustion, chemical reactions, petroleum, natural gas, water gas, etc., which is not new.

"Theory and practice" is thus illustrated: "It is a principle of natural philosophy that two bodies cannot occupy the same space at the same time; but if any man be so unwise as to suppose that this is only a theoretical truth, and persist in the attempt to make his head and a brick wall occupy the same place at the same time, he will after a few well directed and persevering efforts become convinced that the principle is a practical truth." This is a fair example of the author's literary style.

Two-thirds of the first volume is devoted to the science of heat, fuel, etc., and as it is chiefly compiled from other works, the author has naturally fallen into errors in his selections, not being himself familiar enough with the subject to avoid such errors. Such are his references to Professor Johnson's experiments American coal, and his quotations on water gas, the extravagant claims for the economy of which, such as giving 2.78 times the heating effect of the coal from which it was derived have long been exploded.

BOOKS RECEIVED.

[In sending books for notice, will publishers, for their own sake and that of book buyers, give the retail price? These notices do not supersede review in another page of the Journal.]

Graphical Analyis of Roof Trusses. By CHARLES E. GREENE, A. M., C. E. Published by John Wiley & Sons. New York, 1890, Pages, 80. Price, $1.25. Illustrated.

Practical Blacksmithing, Vol. III. By M. T. Richardson. Published by the author, New York, 1890. Pages 304. Price, $1. Illustrated.

The Electrical Engineer's Pocket-Book. By H. R. Kempe. Published by Crosby, Lockwood & Son, London. 1890. Pages 248. Price $1.75 Illustrated.

CORRESPONDENCE.

We invite correspondence upon matters of interest to the industries of mining and metallurgy. Communications should invariably be accompanied with the name and address of the writer. Initials only will be published when so requested.
All letters should be addressed to the MANAGING EDITOR.
We do not hold ourselves responsible for the opinions expressed by correspondents.

The Strike on the New York Central Railroad.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: I thank Mr. R. W. Raymond for his manly words on the strike of the Knights of Labor in the JOURNAL, of the 6th inst. None of our dailies has printed it here. Would it not be well for you to publish the text of Powderly's letter? I believe but few daily papers have printed it, and many of your readers who are managing numbers of men probably have not seen it. Yours, etc., ISAAC BATTIN

OMAHA, 21st September, 1890.

Nickel-Steel Armor Plates.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: Allow me to congratulate you on the splendid success of the nickel-steel armor plates at the recent trials, inasmuch as you were the only technical paper that rebuked an unwarranted adverse criticism on the commercial prospects of that alloy (ENGINEERING AND MINING JOURNAL December 21st, 1889) when it was just being introduced, and in your editorial article of October 26th, 1889, were the first to draw attention to the interesting results obtained by Mr. James Riley with nickel alloys. It is not the first time that you have given aid and comfort to progressive ideas which—when once frowned upon by one of the great scientific barnacles of the period---are apt to be lost sight off and, finally, buried in oblivion because most of the technical papers dare not publish them.

In this instance the German Government would, probably, be highly astonished to hear of the success of nickel-steel armor plates from Washington—because its own professors could not see anything practical in it—but for the fact that the ENGINEERING AND MINING JOURNAL is a very familiar paper with the authorities in that country. Yours truly,

HOBOKEN, September 24, 1890. A. D. ELBERS.

Barytes in Mexico.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: In an article on "The Chemical Industries of Mexico," page 248 of your issue of August 30th, I have just noticed the statement that "Barytes has not hitherto been found in Mexico." I beg to call your attention and that of your readers to the fact that we have on this property some six or eight distinct veins of that substance from one to five feet thick of the purest semi-transparent white color, quite free from yellow, brown, or black iron stains, and a considerable proportion of it has even that delicate very pale blue tint which is so valuable in the highest class of barytes, as it tends to neutralize the prevalent yellowish tint of inferior qualities.

Should any of your readers be interested in the article, I will mention that we are ready to supply any quantity in bulk, carload lots, at $5 United States currency per ton of 2,000 pounds f.o.b. cars at this station on the Mexican Central Railroad.

TORREON SILVER-COPPER MINING COMPANY,
Terrazas Station, Chihuahua, Mexico,
HENRY F. COLLINS, Rest. Supt. and Manager.

September 17, 1890.

Carrying Cuban Ores into Virginia.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: An enormous amount of twaddle has been going the round of the press in regard to the importation of Cuban ores into Virginia, and you yourself have an elaborate editorial on the subject, under date of September 13th. I am in a position to make an authoritative statement with regard to these ores. The Norfolk & Western Railroad Company has not bought any ore properties in Cuba, and does not propose to import Cuban ores via Norfolk for smelting in furnaces along the line of its road. The railroad company is not interested, either directly or indirectly, in the smallest degree in the purchase of the Sigua mines in Cuba, and in the developments now taking place at that point. Some parties interested in the securities of the Norfolk & Western Railroad are subscribers to the stock of the Sigua Iron Company, but they are in a very small minority. The company is purely a Northern company, controlled by Northern and English capital, and its intent is to open up large mining operations at Sigua, and to import the high grade ores found there for any market that may be open, either on the whole Atlantic seaboard, or at approximate points to the seaboard in the interior.

There is an independent scheme on foot to establish steel works at or near Norfolk, because that is a very desirable point for the landing of the Cuban ores in the United States, especially in view of the fact that Norfolk has direct and easy communication with the splendid cokes of the Flat Top region.

I trust that this short statement is sufficiently specific to give the public a correct idea as to who control the Sigua mines.

A single word as to the subject matter of your editorial, touching upon the point of the use of the Cuban ores in Virginia. You are perfectly right in saying that Virginia has not opened up, on a commercial scale, any Bessemer ores. What she may do in this line is yet to be determined; but Virginia possesses enormous stores, beyond any peradventure, of Brown ores, admirably adapted for the making of forge and foundry iron. You understand as well as anybody the value of a high-grade ore as a mixture with lower grade ores for specific purposes, and it is quite within the range of possibility that Cuban ores, delivered at Norfolk, will be used to a certain extent at interior points in Virginia for the purpose of admixture with the Virginia ores for certain purposes. It will be extremely valuable for one use, and that is for a "fix." Virginia has no good "fix" ore. The rolling mills already in operation get their supplies of "fix" either from northern New York, or from the Lakes, and necessarily it is very expensive. If they can avail themselves at Norfolk of a high grade Cuban ore, to serve as "fix," and at a price much below what it is now costing them, it is going to exercise a very important influence in developing the rolling mill business, all along the lines of the Virginia railroads.

ROANOKE, Va., September 23, 1890. EDMUND C. PECHIN.

The Silver Market.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: In the financial article of the *Evening Post* of 24th inst. some statistics are given as to the movements of silver during the past few months.

While these figures are quoted correctly from government reports, I feel that if you will kindly grant the space for a more complete review of them, your readers may gain somewhat different and, I trust, more correct conclusions.

The regular movements of silver began to show the effects of the anticipation of the passage of some kind of a radical silver bill soon after the first of April. It will, therefore, seem to be safe to assume that the situation and stock April 1st was normal. The situation up to that time was about as follows, as we learn from the last annual report of the Director of the Mint:

Monthly production	4,500,000	ounces.
" purchases by government	2,000,000	"
" " for the arts	500,000	"
" excess of export over import	2,000,000	"

Taking the five months from April 1st to August 31st, 1889, we find the excess of exports over imports to be $10,105,558, or, in ounces, about 10,750,000; somewhat over 2,000,000 ounces per month.

Beginning, therefore, at April 1st, we find for that month the excess of production over purchases by the government and for the arts, 2,0000,00 ounces; but for that month there was an excess of exports over imports of $1,085,314, or, at $1 per ounce, of 1,085,314 ounces, leaving a stock May 1st of 914,686 ounces. Adding to this the excess of production for May of 200,000 ounces, and also the excess of imports over exports of $2,181,890 at $1.05 per ounce, amounting to 2,074,000 ounces, makes the stock June 1st 4,988,686. Again for the month of June, add the excess of production as above, 2,000,000 ounces, and the excess of imports over exports of $874,475 at $1.10 per ounce, equal 787,028 ounces, and we find the stock July 1st to be 7,775,714 ounces. In the same manner adding to this the excess of production for July of 2,000,000 ounces, but deducting the excess for this month of exports over imports, amounting to $1,617,911 at $1.10 per ounce, equals 1,470,828 ounces, and we find the stock August 1st to be 8,304,886 ounces. During the month of August we find the first increase of purchases on the part of the government, which amounted in all for the month to about 4,500,000 ounces, or the entire production. We therefore have to deduct from the stock of August 1st the purchases for the arts of 500,000 ounces and also the excess of exports over imports, amounting to $149,910 at $1.15 per ounce,

equals 130,356 ounces, and we find the stock September 1st to be 7,274,350 ounces.

Early in September the Secretary of the Treasury gave a different interpretation to the law from that which had been expected from his purchases to that time. This resulted in making his purchases for September amount to only 3,500,000 instead of 4,500,000, and we therefore again have an excess of production to add to stock of 500,000 ounces for the month, making the stock 8,174,530 ounces, provided there is no difference between exports and imports. We find, however, that during this month to the 20th inst. there were exported from this port about 1,000,000 ounces of silver bullion, while there were imported only about 350,000 ounces, thus reducing the present stock to about 7,500,000 ounces. We, therefore, see that there has been a slight reduction during the month of September, notwithstanding the purchases of the government have only been 3,500,000 ounces instead of 4,500,000 ounces, as they would ordinarily be.

Very much the same results are obtained by examining the stock represented by the certificates listed on the Stock Exchange. This stock was:

July 1st, 6,035,652 ounces; August 1st, 6,662,720 ounces; September 1st, 7,451,053; reaching its highest point September 10th, of over 8,000,000 ounces.

But this has been reduced during the transpiring 14 days nearly 1,000,000 ounces, and is reported to-day at 7,180,000 ounces.

Will this reduction continue, and, if so, at what rate?

From the first of October the purchases for the arts and by the government will exceed the production by 500,000 ounces per month. There are good reasons for believing that the excess of exports over imports will be at least 1,000,000 ounces per month, thus reducing the surplus at the rate of 1,500,000 ounces per month, and practically using it up during the next four months.

The reason for believing the excess of export will equal, if not exceed, 1,000,000 ounces per month are these:

Before this movement began the world had absorbed through London about 2,000,000 ounces per month of our silver. The weekly reports of Messrs. Pixley & Abell, London, to September 11th show no diminution in the shipments of silver to India, China, and the Straits, but rather about the same increase over 1889 as was shown by the increased shipment of 1889 over 1888.

This, with our decreased exports and London's consequent decreased imports, has resulted, as shown by these same reports, in reducing the stock of silver in London between May 1st, 1890, and September 1st, £1,292,453, or in ounces about 5,600,000. Their loss has therefore been nearly as large as our gain, and instead of London holding the stock of the world's silver and making its price, New York has now stepped into her position.

Without doubt London cannot stand this drain upon her stock much longer, and unless some means can be found for lessening the demand from the East, she will very soon be obliged to draw from us about the normal amount of 2,000,000 ounces per month. This expected reduction of stock is also predicated on there being no immediate increase of production. No one expects any appreciable increase of production before next spring at the earliest. On the other hand, as is well known, three-fourths of the world's production of silver comes from the United States and Mexico, and fully three-fourths of this production is derived from the lead-silver ores, and it is believed by those who are acquainted with the remarkable scarcity of these ores during the past six months that the production of silver, at least in this country, is undoubtedly less at this time than it was one year ago. Yours, etc., EDWARD BRUSH.

NEW YORK, September 25, 1890.

THE COPPER MINING DISTRICT OF MICHIGAN AND ITS INDUSTRIES.

Written for the Engineering and Mining Journal.

The section of territory with which this article has to deal is a portion of the Upper Peninsula of the State of Michigan. It was annexed to the State by the Federal government in settlement of the Maumee boundary dispute. At the time, and for many years thereafter it was considered worthless; to-day it is known as a land containing the most extensive native copper and as rich iron ore deposits as are to be found in the world. The copper district of this State, which in 1889 produced 86,000,000 pounds of fine copper, lies on the south shore of Lake Superior and wholly within the Keweenaw Peninsula. This point of land, as will be seen by the appended map, juts into the lake in the form of a bow. It is 60 miles long and 50 miles wide at its base.

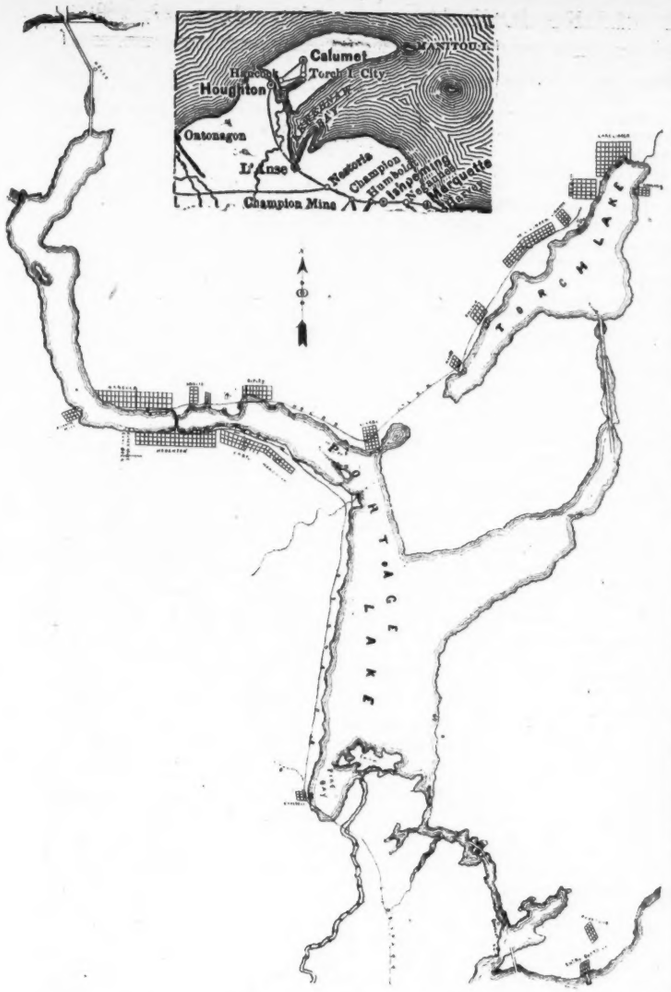
Across its center extends Portage Lake (see map), a trough in an immense fissure. This body of water was connected with the lake on the east by nature; the channel has been widened, and at the same time the west end was connected with the lake by a canal, the three making a commercial waterway. It is in this rocky promontory that the copper-bearing beds exist. The copper is found in its virgin or native state, the only extensive beds of the kind in the world.

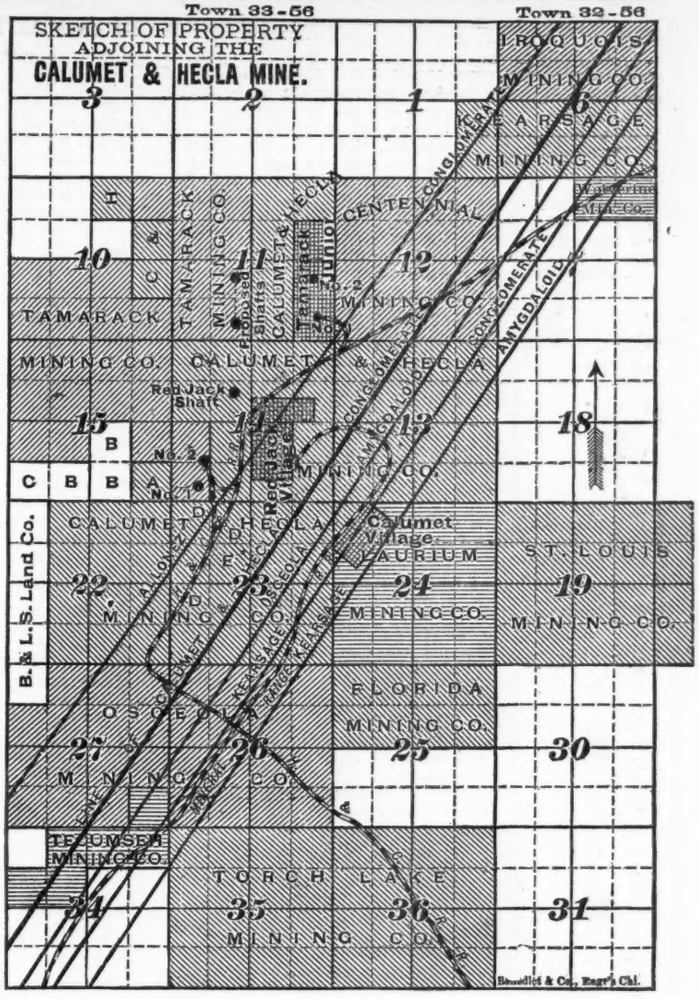
The mineral range takes the trend of the peninsula running northeast and southwest until a point in Ontonagon County is reached, where it makes a semi-circular turn to the north. The dip through a greater portion of its course is westerly at an angle ranging from 38 to 52 degrees. The district is divided into three counties, *i. e.*, Keweenaw to the north, Houghton in the center and Ontonagon to the south. An island, Isle Royale, 46 by 8 miles in extent, lying in Lake Superior, 40 miles off the shore, is included in the mineral belt. More will be said later concerning this island and its important relation to the geology of the district. The geological structure of the country is interesting, and a question concerning which experts are at variance. The country rock is lava flow, commonly called "trap," carrying amygdaloidal lodes and conglomerate beds of mineral, and in addition the Potsdam sandstone. The trap is bounded on the west through a greater portion of its course by Lake Superior, and on the east by the Potsdam. The geological relation of this sandstone to the trap is the question which has created two opinions. From outcrops at the contact it has been found that the sandstone extends under the trap. The relative positions, Irving and Chamberlin claim, were brought about by an inverse fault of the trap. In view of this belief, they give the trap the older classification, in fact, the base of their geological column—the Keneenaw division of the Archean age. Wadsworth and co-workers hold that the sandstone is overlaid by the trap; that the first lava of the series flowed over the sandstone; subsequently a fault line or fissure was formed at the contact. In substantiation of this hypothesis they assign the copper-bearing series a place in the Paleozoic. It is not the purpose of the writer to side with either theory, suffice it to say that the economic problem involved, namely, whether the sandstone underlies the trap formation, is one which, at the present day, is of remote importance, as the present workings have proved that the mineral belts possess every indication of extending to immense depths. Numerous true fissure veins cut the point in Keweenaw County. Subsequently in these were deposited copper, quartz and associate minerals. With a few exceptions these veins are not now worked. The principal mining operations are now confined to the old lavas. These were greatly acted upon by water and other agencies, depositing in their masses different minerals and more or less copper. The copper is found in strings, globules and irregular masses, so characteristic of amygdaloid deposits. The deposition is not in veins, but only impregnations of old lava flows, hence forming beds. It is from these beds that the exceedingly large masses have been taken. The third class of deposits are conglomerates. These are known to be old sea beach deposits, the cementing mud of which was removed by percolating water and the spaces filled with copper and associate minerals. These different mineral beds and lodes lie side by side and preserve a parallelism in their dip. In Houghton county they form a belt 14,000 feet wide, and dip toward Isle Royale at an angle of from 38 to 52 degrees. The island Isle Royale, of which mention has previously been made, was acquired by the United States, owing, it is said, to the sagacity of Benj. Franklin. The story goes that he had learned from the Jesuits' records in the French archives that there was copper on the island. As a member of the Commission to settle upon the boundary line between the United States and the British provinces, he ceaselessly drew a red line across the map so as to include the island, which lies within 18 miles of the Canadian shore. That there are copper beds and lodes on the island has been proved by actual mining. These have been found to dip to the east, or toward the main land. The deposits are the same in character as those in Houghton county, although the dip is much nearer the horizontal. From these two facts it is held by many that the one is a continuation of the other, and that the portion of Lake Superior which lies between the two, is underlaid by copper rock. This theory seems to receive substantiation in many ways; its truth, however, will be for the future to verify.

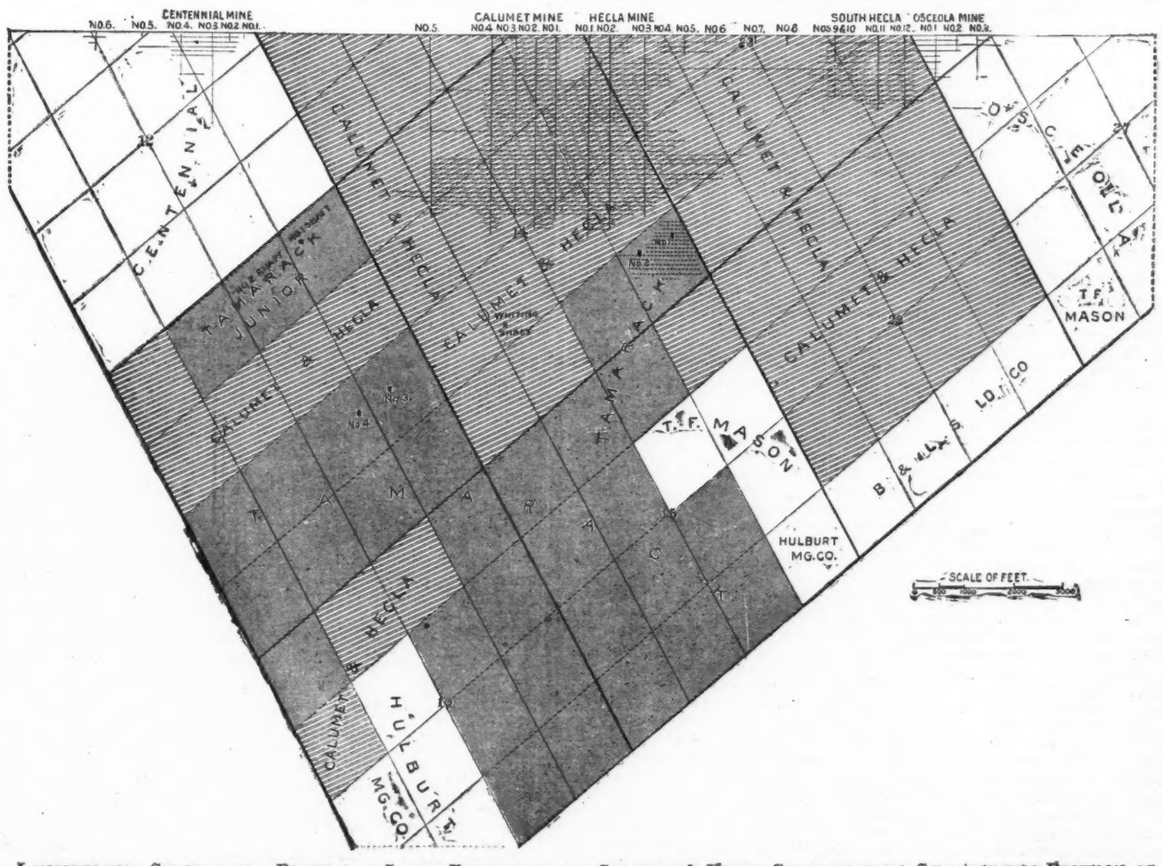
Mining operations in this section date back to the time of the aborigines. To-day, on Isle Royale, are to be found their pits and implements. We know not from whence they came nor where they disappeared, but the fact that they lived and worked these deposits is evidenced by the remains of their industry. The venerable Jesuit missionaries, Fathers Marquette, Mesnard and Allouez, who were the first white men to traverse the rock-ribbed shores of this great unsalted sea in their work of Christianizing the savage, knew of the existence of the metal. In 1770–72, Alexander Henry, an English explorer, encouraged by finding a piece of float on the banks of the Ontonagon River, mined for copper, but his shaft was sunk in a clay bank and his search was unrewarded. In 1841 Dr. Douglass Houghton reported to the Michigan legislature the results of his ten years' geological and mineralogical observations in the country. It was the tocsin which called the hardy pioneer to the wilderness of the Lake Superior regions. As early as 1844 the settlement of Copper Harbor was founded and in 1848 the settlements of Eagle Harbor and Eagle River, in Keweenaw county on the lake shore, were in existence.

Early operations were confined to fissure veins from which mass copper was mined. The first mining was done at Fort Wilkins, on the north shore of the peninsula, with small results. In 1845 the Cliff mine was opened, and it can be said to be the pioneer mine of the copper range. In 1847-48 the Minesota lode in Ontonagon county was discovered. Keweenaw county soon became a scene of great activity. Mines were developed, institutions sprang up and its inhabitants increased in numbers. To-day as the tourist drives over its macadamized roads a scene most desolate meets his gaze. Of the 50 odd mining locations only three are working. Whole villages stand intact, except where Time in its ravages has left its mark. Not a soul is to be seen, save the keeper of the properties or an occasional farmer who wrestles a scanty living from a barren soil.

The reason is not far to seek. At the time this section reached the acme of its development, the price of copper was high. It could be mined to a shallow depth by the crude machinery and low explosives. The war time came, calling the miners to the defense of their country, leaving the mines crippled for lack of labor. Later, the works gradually grew deeper, managements did not possess sufficient foresight to explore properties thoroughly, the price of copper lowered, and miners gradually drifted from this section and Ontonagon county to fields which gave more promise—namely, Houghton county. As a result, to-day there are but three mines producing in Keweenaw county—the Allouez, Central and Copper Falls—while in Ontonagon county the National mine is the only one which has been worked to any extent during recent years. It will thus be seen that Houghton county is the seat of the copper mining of the present day, and the object of our description. Within its boundaries are located the Atlantic, Franklin, Huron, Kearsarge, Osceola and Quincy amygdaloid mines, and the Calumet & Hecla, Centennial, Peninsula and Tamarack conglomerate mines, all of which are now in operation, and besides these the Allouez, located just across the boundary in Keweenaw county on a conglomerate. There is a large number of promising properties either standing idle for various causes, or being explored and equipped for production. All of these properties, with the exception of the Tamarack, are worked on the same general plan. Shafts are sunk so many feet apart on the angle of and in the footwall of the lode. The levels are, as a rule, run in the deposit every 100 feet. The width of the deposit varies from 4 to 30 feet. The percentage of mineral in the rock runs from seven-eighths in the Atlantic to five per cent. in the Tamarack. The hanging and foot walls are distinctly marked, and there is to be found but comparatively little change in the angle of the dip. In fact, the conditions for symmetrical mining are as nearly perfect as could be desired. The stoping is mostly breast and rising. The hanging wall, which is a hard trap,







LONGITUDINAL SECTION OF A PORTION OF LANDS EMBRACING THE CALUMET & HECLA CONGLOMERATE, SHOWING THE POSITION OF ALL THE SHAFTS, JULY 1, 1890.

is stable and is supported by stulls,—immense timbers, masonry in some cases, and often by vein matter left for the purpose. The shafts are of one, two or three compartments; of late the balance skip is being introduced, and it is being used with great success. These shafts are sunk a little year by year, keeping one or two levels ahead of the stoping operations. They are very expensive pieces of work, and care is always taken to leave them protected by a wide collar of vein matter. They have in many cases reached immense depths, necessitating heavy hoisting plants to operate them. As a result many of the mines are now in possession of plants which have seldom been excelled in point of size and efficiency. The mining is carried on by contract, so much per cubic fathom of ground broken. The power used to a large extent in drilling is compressed air. There are three classes of laborers underground, miners, trimmers and timbermen. A miner averages $65 a month in wages.

The mines without exception are, by means of a down and up cast, excellently ventilated, the draft, as a rule, increases in force with the depth of the mines. The depth of the mine does not seem to affect the temperature. The writer in a visit to the bottom of the Tamarack, now about 2,800 feet vertically, found the air as pure, dry and even in temperature as that of the beautiful spring weather reigning outside. Each mine is provided with a milling plant, where its copper is concentrated, and either owns or has contracts with the refining plants established in the county. These industries will be dwelt upon later. In making special mention of the mines space forbids that all be treated separately. The great Calumet & Hecla, of course, demands notice as well as its smaller but promising neighbor, the Tamarack. These two are working the Calumet conglomerate, and will be described later. As an amygdaloid mine, the Quincy, the third largest producer in the district, commands notice as being typical of others of its kind. It is located on a huge bluff overlooking the villages of Hancock and Houghton on either side of Portage lake. Mining operations were begun here in 1853. The mine has been a profitable investment for the past twenty-five years, and is to-day valued on stock boards at $3,200,000. There is but little to be said concerning this property apart from the general description preceding. The works, being in an amygdaloid bed, are much easier to carry on than in the conglomerate, on account of the soft character of the rock. This also reduces the cost of milling. In mines located in deposits similar to the Quincy the metal-bearing rock is irregular in the degree of copper carried. It averages 2 per cent. Early in its history it pursued the policy of keeping its mine opened far ahead of present needs. In this way it is able to make selections of rock, as well as to control its output. The lode is from 10 to 30 feet wide, and has been opened to the thirty-ninth level, 3,900 feet on the angle. Two shafts extend to the bottom; through these the hoisting is done. No. 4 has recently been equipped with a balance cage. A man engine shaft extends to the thirty-third level. Forty per cent. of the Quincy's product is mass and barrel mineral. It is treated by a steam hammer, obviating the otherwise necessary milling. During the year which has just passed the company has completed a fine milling plant, including three head of Ball's stamps, and is now using it. Previously an old mill, located on the shore of Portage Lake, near the mine, and equipped with Cornish stamps, was used. The rock was sent down to this mill by means of balance cars over a gravity tramway.

While making our observations in the neighborhood of Portage Lake it will be well to make note of the relative location of the mines in this district. The Huron lies to the south of the lake and the Atlantic to the south and west. The former is a non-dividend payer, producing about 100 tons of mineral a month, and is owned principally in New York. The latter, although its rock is the lowest grade worked, $\frac{7}{8}$ of 1 per cent., has, under excellent management, been a dividend payer for years. The majority of its stock is owned by John Stanton, of this city. Its monthly product is 225 tons of mineral. The Pewabic lies north of the Quincy on the same deposit. The curse of litigation has been upon it for about eight years. It is soon to be sold under an order from the United States Supreme Court. It will be bought by either the Quincy or Franklin stockholders within a few weeks, and doubtless added to one property or the other. It became a producer in 1855, and during its existence has yielded 13,894 tons. The Franklin lies on the north side and adjoining the Pewabic. It has been a good mine in the past, but has about exhausted its territory. It is only the question of a few years before it must acquire title to adjoining ground or suspend operations. Its monthly output is about 200 tons of copper mineral.

The mineral belt in the vicinity of the Calumet & Hecla mine, about 10 miles north of Portage Lake and six miles east of Lake Superior, is the seat of the most extensive mining operations in the county. The appended map, published some time since in the Calumet *News*, shows the different mineral-bearing lodes and beds, and the location of the different mines with respect thereto. It will be remembered that the dip is to the west, and in this district at an angle of about 38 degrees.

The Tamarack, one of the mines of this district, is an outgrowth of a bold conception carried to a successful issue. Its present efficient superintendent, John Daniell, conceived the plan of sinking a vertical shaft at a point beyond the Calumet & Hecla boundaries, for the purpose of tapping the Calumet conglomerate bed, which he had every reason to believe could be reached at any point west, the direction of its dip and of its outcrop, by a shaft of sufficient depth. Title was acquired to 1,280 acres of land in the mineral belt by the Tamarack Company, and the shaft started February, 1882. In June, 1885, three and one-half years later, the brightest expectations of the management were realized. The vein was cut at a depth of 2,270 feet. It was an extraordinary undertaking, that of sinking a hole half a mile into the earth with no positive assurance that there would be returns for the thousands of dollars which must be expended. To quote the language of a modern author, "it was a radically bold project, thoroughly reasoned out from inception and rapidly, economically and successfully brought to a conclusion." Through it many economic results were attained. It added to the world's wealth vast stores of rich copper deposits heretofore inaccessible. It showed to the Calumet & Hecla, whose property, strictly speaking, lies above, that it had in store vast quantities of vein matter rich in copper, the nature of which, up to this time, could only be speculated upon. Among all persons interested in the geology of the country, in the problems of mining, in the value of stocks and investments, it disseminates information which is invaluable. It gave an impetus to mining and enhanced values of mining properties throughout the district, inasmuch as it proved the great depth of the copper deposits and showed a new, successful and economical way of working them.

The Tamarack mine became a self-paying institution from the date the conglomerate was reached. If the reader will refer to his files of the ENGINEERING AND MINING JOURNAL of 1885, page 194. he will find a complete description of this shaft, with accompanying diagram, showing its relative location to the properties in the neighborhood. In addition to the description already given, it is sufficient for us to say that it is 2,270 feet deep, 19×7 feet inside the timbers, and divided into three compartments, two of which are equipped with a balance-cage-system hoist, the third being used as a man and timber way. The surface equipment of the plant in the line of rock house, rock breakers, hoisting engines, boilers, air compressors, etc., is the best that money and mechanical skill could perfect. No. 1 shaft cut the conglomerate between the second and third levels, and was continued until a depth of 2,715·8 feet was attained. The lode is reached from the shaft at different levels by horizontal cross-cuts. Every 100 feet a level is run longitudinally through the lode. Ascending and descending on the lode are effected by means of numerous winzes. At the close of the fiscal year, June 30, 1889, the mine had been opened to the 11th level. During the year just passed several additional levels were cut. Inspired by the successful completion of the first undertaking, the Tamarack Mining Company commenced a second or No. 2 shaft in March, 1886, 720 feet northwest of No. 1 shaft. It reached the conglomerate on September 2d, 1889, at a depth of 2,575 feet, striking a point between the eighth and ninth levels. When this new shaft reached a depth opposite the second level in No. 1, a crosscut was driven, giving the mine two outlets, thus insuring greater safety to operators in case of accident, and affording a better system of ventilation. Later crosscuts were run between the two shafts on the eighth and twelfth levels. No. 2 shaft was equipped a number of months ago for hoisting mill rock, but the company, instead of increasing the mine's production, decided on the more economic policy of opening the mine ahead of present needs, so that production by both shafts would not be crippled after it is started in earnest.

The combined shaft and rock house at No. 2 shaft is among the best in Michigan. It is 110 feet high, 72 feet long by 45 feet wide. The rock is received in cars by way of the cages at an elevation of 32 from the ground, and is passed to the rock crushers with a minimum amount of labor. The crushers are three in number; the sizes are 18 × 24 inches, 13 × 20 inches and 8 × 14 inches. The rock, after being reduced to suitable size for milling, falls into pockets, from whence it drops into cars for transportation. The engine house is 65 × 45 feet in dimensions. The power consists of two Corliss engines of 42 × 72-inch cylinders. The drum is 30½ feet in diameter with an 11-foot face. It is estimated that it will hoist four tons of rock 2,500 feet per minute. Overwinding of the cage rope is made impossible by a device which shuts off steam and applies the air brake automatically. During the calendar year 1889 the average monthly output was 442 tons of mineral. This was made through one shaft.

During the spring two more vertical shafts were started on section 11 of the company's property, about 5,000 feet north and west of No. 2 shaft. They are making good progress, and owing to their relative westerly position will not reach the lode within as short a distance as did Nos. 1 and 2.

The Tamarack, Jr., Mining Company, which is a separate company, controlled by the same capitalists as is the Tamarack, and under Captain Daniell's management, owns 120 acres of land north of the Tamarack property and separated therefrom by Calumet & Hecla possessions. Two vertical shafts are being sunk to the lode. At the close of the month of August No. 1 shaft had reached a depth of 2,300 feet, and is expected to be in the conglomerate in two months. No. 2 shaft is about 500 feet behind No. 1 in point of depth.

The Calumet & Hecla is the largest mine in the district, and one of the most extensive and thoroughly equipped in the world. The deposit was discovered in 1866 at a point not far from the ground on which the Superior engine house now stands. At that time the country was a dense wilderness, being penetrated only by a trail which extended from Portage Lake to Keweenaw County. The "find" was made in a pit which had been dug by some prehistoric miner, and was brought to the notice of the world by E. J. Hulbert. At the time mining experts held but one belief in regard to the copper deposits of the district, namely, that copper in paying quantities could only be found in amygdaloidal rock.

For a short time the 20,000 shares of stock of the Calumet company were a drug in the market. However, it was not long before the most skeptical were convinced of the great value of the deposit, and in the year in which the discovery was made, a second company, the Hecla, was organized with the same number of shares to work a portion of the territory. In 1872 the two companies were consolidated into the Calumet & Hecla, on a basis of 40,000 shares. Since that time stock dividends have been declared at different periods and the stock increased to 100,000 shares, the limit under the law of the State of Michigan. The par value of the shares is $25. The present market value of the stock is $310. The company has paid in dividends a total of $34,350,000.

The present advanced stage of development and the extensive equipment furnish a subject too vast to be fully treated in the limited space at our command. The length of the conglomerate lode or bed which extends across the company's property is 14,000 feet. Its average bearing is north 39 degrees east and south 39 degrees west. Its dip with the horizon is 37½ degrees westerly. The height above Lake Superior is 640 feet. The thickness of the mineral-bearing belt is 8 to 30 feet. Reckoning the thickness at 12 feet, there are 2,400 cubic fathoms of mineral-bearing rock to the acre. The yield of ingot copper to the cubic fathom of rock is 1,300 pounds. It is estimated that the company owns 1,300 acres of unexploited mineral land. At 16 cents a pound, the reader can easily compute the value of copper in the ground. Along this distance of 14,000 feet is to be found a great chain of buildings in which is located the extensive machinery used in operating the mine. There are 18 shafts on the property; levels are run 100 feet apart. The mine is divided into three sections, the Calumet, containing six shafts; Hecla, eight, and the South Hecla, four. The Calumet shafts, 1, 2, 3, 4 and 5, and Hecla shafts, 1, 2 and 3, are the oldest and deepest. The greatest depth reached is the 39 level, or 3,750 feet

measured along the incline, a vertical depth of 2,280 feet. The South Hecla is connected with the Hecla portion of the mine by a level 700 feet below the surface. After the fire in the mine in 1887 this was sealed up. On March 1st, 1890, the mine was producing through seven shafts, Nos. 4 and 5 Calumet, 3 Hecla, and 9, 10, 11 and 12 South Hecla. Repairs were being carried on at No. 2 Hecla, the seat of the fire in 1887, and No. 3 Calumet, the portion so greatly damaged by the fire in 1888. The man-engines in these two shafts have been taken out. The men are now transported by seven cars constructed for the purpose, operated by plants of machinery distinct from those used in hoisting. No. 6 shaft is being holed to the 26 level. In the South Hecla No. 12 has reached the 16 level, and Nos. 9, 10 and 11 the 18 level. Nos. 9 and 10 constitute a single shaft. No. 3 Hecla is down to the 34 level, and two additional levels will bring it to the horizon of the upper point of the Tamarack. The thirty-ninth level, the deepest working in the Calumet and Hecla, corresponds in depth with the fifth level of the Tamarack. The company has been engaged for a number of years in sinking a 15½ × 25 foot six-compartment vertical shaft opposite and 5,000 feet to the west of No. 4, Calumet shaft. At the present writing it has reached a depth of nearly 2,000 feet. According to estimates the conglomerate will be reached at a vertical depth of 3,400 feet, or the sixtieth level. It will require about two years to complete the work. This shaft will meet, at a point 2,100 feet deep, by a cross-cut from the thirty-sixth level, No. 4 shaft, 1,700 feet in length. The connection will be effected some time this year. As soon as it is made, four of the compartments of the shaft will be fitted for hoisting rock and the other two will be used in sinking the shaft to the depth already mentioned. That section of the mine in the vicinity of this shaft has not been stoped below the twenty-eighth level. The vertical shaft will furnish a much more economical means of hoisting the copper rock. In this connection it will not be out of place to quote Captain Daniell, of the Tamarack mine. He says: "We have demonstrated the fact that depth is no hindance to cheap mining. On the contrary, we have shown from the results of steady work, day in and day out, for months, that more than five times the amount of rock can be hoisted through a vertical shaft than through one of like dimensions sunk on the plane of the lode, as is the custom of copper mining elsewhere at Lake Superior." A hoisting plant, said to equal any in the district in point of capacity, is being erected at this shaft. Much more might be written concerning the working of the Calumet & Hecla, but enough has been noted above to give the reader an idea of their extent.

This mine possesses a most elaborate and extensive system of machinery. The largest piece is the Superior engine, located between Nos. 3 and 2 Calumet shaft houses. It was designed by E. D. Leavitt. It possesses an estimated horse power of 4,700 and an ordinary working capacity of 2,300 horse power. Its cylinders are respectively 5 feet 10 inches and 3 feet 6 inches in diameter. Its weight is 350 tons. It is used for hoisting in different shafts and in running certain of the compressors. The "Calumet" and "Hecla" engines possess each a 1,000 horse power capacity. The cylinders of the former are 23¼ inches in diameter, high pressure, and 36 inches, low pressure, stroke 6 feet. There are many other engines used for hoisting, running compressors, rock breakers, etc. The subject can be dismissed with the following description of a hoisting plant recently constructed:

It consists of three triple expansion, vertical inverted beam engines, designed to hoist 10 tons at a speed of 2,000 feet per minute. The cylinders are 18 inches, 27¼ inches, and 48 inches in diameter, all by 7-foot 6-inch stroke. Each is provided with four gridiron valves worked by independent cams, so made as to equalize the cut-off. The high pressure cylinder only is provided with an adjustable cut-off, ranging from 0 to $\frac{9}{10}$ stroke. This is automatic, and is controlled by a hydraulic governor actuated by a high-speed ball governor. Between the high-pressure and intermediate cylinder, and the intermediate and low-pressure cylinders are reheating receivers. The shaft is hollow, 29 feet long, 22½ inches in diameter, with a 7-inch hole throughout its length. Its bearings are 22 inches by 40 inches. The shafts, cranks, pins, piston rods, cross-heads and links are made of the finest quality of Krupp crucible steel. The outboard pedestal of the shaft is provided with a ball and socket shaft. The fly-wheel is 30 feet in diameter.

The hoisting system is the constant motion non-reversing friction system, the drum rotating with the engine shaft when hoisting and on the shaft when lowering. The hoisting drum is conical, 27 feet in diameter at one end and 14 feet 7 inches at the other, and turned with a spiral groove to accommodate 5,500 feet of 1⅛-inch wire rope. The engine, by means of an automatic device, varies its speed from 30 to 45 revolutions per minute, thus hoisting at a uniform rate. The power is thus varied as more or less rope is to be hoisted. The engine house, which contains also the pumps and accumulators, is 112 feet long by 68 feet wide, and is commanded by a 30-ton traveling crane.

The boiler house is 76 feet by 68 feet. It contains five boilers of the Belpaire type, 90 inches in diameter. They are the largest Belpaire boilers ever built, and weigh 86,000 pounds each. The fireboxes are each 4 feet 7 inches wide inside by 9 feet long, but the last 18 inches are covered by firebrick. A brick arch extends from this wall toward the fire door. There are 201 tubes 3 inches in diameter and 16 feet long in each boiler. The flues from the firebox to the combustion chamber are 3 feet 3 inches long, and the combustion chamber is 4 feet 3 inches long. The total length of the boilers is 34 feet 5 inches, width over all 10 feet 5 inches and height 9 feet 6 inches. The total heating surface of each boiler is 2,985 feet and grate surface 68¼ feet, ratio, 42·1 to 1. The circular shell is ½ inch thick, the outer firebox $\frac{19}{32}$ inch and the inner firebox ⅜ inch thick. The tube sheet is ½ inch thick. All sheets are of Otis steel, 37,000 pounds elastic limit, and 20 per cent. elongation in 15 inches. The working pressure is intended to be 185 pounds per square inch.

These boilers have shown themselves capable of giving out 1 horse power for each 4 square feet of heating surface when driving a compound engine. The Calumet & Hecla Mining Company has in service and ordered 46 of these boilers, 19 of which carry 185 pounds steam pressure and the remainder 135 pounds.

Up to recent date ships of 2½ tons capacity were used in most of the shafts, and a 5-ton capacity skip in No. 4 Calumet shaft. It is understood that trials are now being made with skips of 10 tons capacity with a view of introducing them in certain portions of the mine. About 3,000 tons of rock are hoisted per day. Up to recent date this rock was crushed at rock houses centrally located. It is understood that the future policy of the company will be to handle the product of each shaft separately and rock houses are now being built in conjunction with shaft houses. Those portions of the mine which have been stoped out, are filled with heavy timbers. These stulls aggregate millions of feet. It was among these timbers that the disastrous fires of August, 1887, and November, 1888, raged, necessitating the complete suspension of mining operations in the first instance, and in the Calumet & Hecla portions of the mine during the second fire. The hanging wall of the old portion of the mine is very unstable, causing much trouble by settling. The best means of sustaining it is a problem which is being earnestly discussed by the management. It is said that the trap rock which is taken from the cross-cut now being driven from the 36 level, No. 4 shaft, to the Red Jacket vertical shaft, is used in place of timbers in certain portions of the mine as an experiment. The point which the company is trying to determine is whether it will pay to mine rock from the walls for this purpose. About 150 air drills are in constant use. The mine is worked in two shifts.

It will readily be conceived that the mine requires a most extensive equipment. The company owns and operates one of the largest machine shops in the State, numerous blacksmith shops, lumber yards, saw mills, etc. A water-works plant was recently completed, takes the water from Lake Superior, six miles away, supplying it to the mine and works. A railroad, the Hecla & Torch Lake, six miles long, owned by the company, extends to Torch Lake, where the stamp mills are located and from which point supplies of all kind for the mine are brought in. The company employs between 3,000 and 4,000 men. Two large villages, Calumet and Red Jacket, are mainly supported by the Calumet and Tamarack mines.

The following shows the number of tons of rock stamped and the per cent. of copper obtained since 1875:

Year.	Tons of rock stamped.	Yield per cent. of ingot copper.	Year.	Tons of rock stamped.	Yield per cent. of ingot copper.
1875	249,704	4.3	1883	372,570	4.45
1876	259,935	4.37	1884	435,352	4.63
1877	247,935	4.55	1885	535,820	4.32
1878	271,000	4.66	1886	598,522	4.22
1879	244,715	4.61	1887	654,055	3.52
1880	334,343	4.75	1888	763,728	3.28¼
1881	340,080	4.61	1889	807,918	3.012
1882	344,132	4.59			

The output during the life of the mine has been 301,538 tons of copper. The controlling interest in the property is said to be held by Alexander Agassiz, of Boston.

Among the other mines in this vicinity, is the Osceola, which at one time operated on the Calumet conglomerate, and is now working an amygdaloid. It is one of the leading properties on the lake. The Kearsarge is an amygdaloid mine, and an excellent property. Both are under the same management as the Tamarack. The Centennial, located on the Calumet conglomerate, north of the Calumet & Hecla, was started up in 1889 after an idleness of a number of years. It is not yet a producer, but is said to have an excellent prospect. It is under the same management as is the Franklin.

By referring to the ENGINEERING AND MINING JOURNAL of January 4th, 1890, it will be seen that 86,000,000 pounds of fine copper were produced in the Lake copper district last year, all of which was native copper.

Name of company.	Amount of dividends paid to Sept. 31, 1890.	When became producer.	Production in 1889.	Total production to Jan. 1, 1890.
Atlantic	$660,000	1866	1,849	23,788
Allouez		1856	881	11,428
Calumet & Hecla	34,350,000	1867	24,334	301,538
Central	1,950,000	1856	635	20,356
Copper Falls		1855	434	10,790
Franklin	960,000	1857	2,173	31,741
Huron		1855	1,109	10,652
Kearsarge	100,000	1887	10	1,434
Osceola	1,372,500	1874	2,267	25,312
Quincy	5,570,000	1856	3,202	53,250
Tamarack	1,620,000	1885	5,303	16,624

In a future issue more will be said concerning this district, especially its milling, smelting and manufacturing industries.

STEEL VS. CAST IRON WATER PIPES.

Mr. Jas. C. Bayles, president of the Spiral Weld Tube Company, in a letter to a contemporary, says:

I venture the prediction that the days of the cast iron pipe are nearing an end. They represent too much dead weight for too little strength. Wise engineers long ago reached the conclusion that the most costly and least satisfactory way of protecting iron against oxidation is with mere bulk of its own substance, and those most concerned in the future of cast iron pipe, for business reasons realize most keenly the fact that it is destined soon to take its place among the materials forced into disuse by the progress of the arts. Mr. Hamilton Smith, Jr., who stands very high in the profession of hydraulic engineering, in a paper contributed to the British Iron and Steel Institute, and published in Vol. I. of its transactions for 1886, furnished data as to the life and strength of wrought iron and steel pipes for water conveyance, which left little room for further discussion.

The query presents itself: Why should not wrought iron, or still better steel, be used for conduit pipes in preference to cast iron? If it answers the desired purpose in California, why should it not do so in other parts of the world. To one like myself, who has for years been accustomed to the California practice, it seems as irrational to build a pipe, carrying water under considerable pressure, of cast iron as it would be to build a suspension bridge with the supporting chains made of cast iron.

The ideal conduit for high pressures is a welded steel tube: such tubes could probably be subjected to a tensile strain of 25,000 pounds with perfect safety, and would be much preferable to riveted pipe, not only on account of superior strength, but also by reason of almost perfect interior smoothness. The adaptation of a superior and cheap metal, such as mild steel, for conduits, will permit the construction of hydraulic works in many parts of the world which now appears to be impracticable, owing to the cost of many of the methods still in use for the transportation of water.

THE WASHINGTON BRIDGE.*

This bridge was built by the city of New York to carry 181st street of New York over the valley of the Harlem, connecting Tenth avenue on the West side, with Aqueduct avenue on the eastern side, a distance of 2,375 feet. Its clear height, 133·5 feet above the water, is ample for the needs of navigation.

It was begun in July, 1886, and completed in March, 1889. The contractors were the Passaic Rolling Mill Company and Myles Tierney. The principal engineers were W. R. Hutton, chief engineer; W. J. McAlpine and Theo. Cooper, consulting engineers; Alfred Noble, resident engineer from October 1st, 1886, to June 30th, 1887, succeeded by John Bogart.

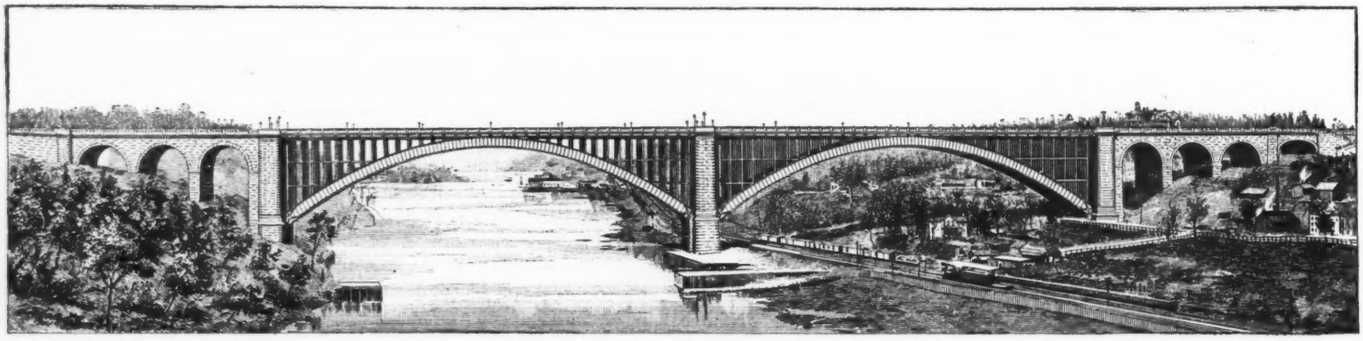
The Commissioners are Jacob Lorillard, Vernon H. Brown and David James King; Secretary, Malcolm W. Niven.

It is composed of two steel arches, each of 510 feet span, three piers, two abutments, and approaches formed chiefly of embankments supported by retaining walls. These carry a roadway that is nowhere less than 80 feet in width between the parapets, of which 50 feet is a carriageway, with two sidewalks each 15 feet in width. The latter are protected by a heavy balustrade of iron and bronze, and an iron cornice and frieze covers the ends of the main floor-beams.

Tenth avenue being 27 feet higher than Acqueduct avenue, the grade descends eastwardly both on the east and west approaches, at the rate of three and a half per cent. The abutments are level, 151 feet above mean high water. Over the steel arches the profile is a curve 1·34 feet higher at the centre pier than at the ends.

The main piers are 40 feet thick at the springing line of the steel arches and 98 feet long. To the top of the skew-backs they are solid, made of concrete, with a facing of dressed granite.

The weight and thrust of the six steel ribs forming each arch are borne by the skew-backs—large blocks of granite set normal to the thrust of the arch-ribs, and backed by granite blocks and concrete. Above the skew-backs the piers are cellular in construction, and nearly 100 feet in height.



THE WASHINGTON BRIDGE.

The abutments, 235 feet in length, are formed of three semi-circular arches of masonry, each of 60 feet apart, carried by small piers 13 feet thick at the springing line of the arches.

The main piers and abutments are crowned with a deep bracketted cornice, with parapet. The approaches have a much lighter cornice, and a lower parapet, and a portion at the eastern end is protected only by a heavy rail of bronze.

Although all portions of the work were systematically pushed forward, the principal effort was directed to the completion of the piers to the top of the granite skew-backs, so that the erection of the steel arches might be commenced as soon as the material was prepared.

Work was begun under the plans of May, 1886, but until the completion of the bridge those plans were modified in order to secure greater durability and beauty.

The granite used was from the quarries of Biddeford, Mt. Waldo and Vinal Haven.

The cornices, parapet, etc., were made from a finer quality of granite of uniform color from the Mt. Waldo quarries.

The light gray gneiss ashlar for the long faces of the piers and facing the approaches was from the Mine Hill quarries near Roxbury, Conn.

Rubble masonry was of gneiss largely from the excavations made for the foundations.

The stone for concrete was chiefly supplied from limestone quarries on the Hudson River.

The cement chiefly used was Rosendale from the New York and Rosendale Works. It was of excellent quality; tests for tensile granite was supplied from different quarries. The material of the arch over Undercliff avenue is red granite from Leetes Island, Conn., the same as that used in the pedestal of the Statue of Liberty.

The substructure consists of three main and a number of of small piers. At the site of pier I., on the west side of the river, no other preparation was required than to remove the surface-earth and shape the rock to receive the masonry.

At Pier II. the solid gneiss rock lies at a considerable depth except at one point, where it rises to within 17 feet of mean high tide in the river and where, therefore, Pier II. is located.

As the question of time was of the first importance, a foundation upon a timber caisson, to be sunk by means of compressed air, was adopted and plans submitted by Anderson & Barr were approved on September 3d, 1886.

The caisson, which was built in place, is 104·8 feet long, 54·4 feet wide at base, and 13·3 high, with one foot batter in its height on all the sides. It is made of Florida-pine timbers, 12 inches square, only the shoe being of oak. The walls of the chamber, three feet thick, are formed of horizontal timbers on the outside and inside of a series of vertical timbers. Alternate verticals are cut off at the top of the working chamber; the intermediate timbers rise nearly to the top of the caisson. By this arrangement half the transverse and longitudinal timbers of which the roof is composed extend to the extreme ends and sides of the caisson, and hold in place the verticals, which thus serve as stiffeners to the sides and ends. The roof is composed of four courses of 12 × 12 inch timbers laid transversely, and two intermediate courses laid diagonally. The latter are stopped some ten feet from the end of the caisson, and the course is completed with short timbers placed longitudinally, to secure the end verticals and tie them to the remainder of the structure. Each course was well fastened with drift-bolts to the course below, the whole forming a solid mass of timber about six feet thick. The sides of the chamber and first courses of the roof were poured, as the timbers were placed, with hot coal-tar; the remainder was grouted with cement. The inside of the working chamber was lined with boards and asphalted paper, which was covered with tongued and grooved boards, 1¼ inches thick, the joints of which were put together with white lead.

The two longitudinal division walls, each two feet thick, extending from the roof to within two feet of the bottom, were built of horizontal courses of 12 × 12 inch timbers, with openings 2 × 2 feet, for communication between the chambers formed by them; these were firmly secured by straps and bolts to the end walls. The side walls were braced and tied at nine points with timber braces 12 × 12 inches, and iron tie rods. There were two air locks, as shown on the plans, one on top of the shaft, four feet in diameter, for general service; the other, five feet in diameter, inside the caisson, was used for the extraction of material. There were also a shaft, 18 inches in diameter, and a number of blow-out pipes, four inches in diameter. The caisson, built in an inclosure formed by acofferdam, settled during its construction two or three feet into the mud, and moved slightly out of position, but was readily brought into place by means of turnbuckles on the chains which secured it to the bank.

The material to be excavated was from eight to eleven feet of mud, then heavy gravel with large boulders, and, finally, a very irregular rock, partly gneiss, partly marble, with veins of quartz. The attempt to blow out the mud by compressed air through the four-inch air pipes proved unsuccessful. The rock on the northeast corner of the caisson was 17 feet below mean high water, while at the southwest corner it was more than 40 feet below.

The rock was drilled with a "Rand" drill, operated by air at a pressure of 80 to 100 pounds per square inch, the effective pressure being 62 to 80 pounds. Dynamite ("forcite") was used as an explosive, but it was soon replaced by "rack-a-rock." The holes were four to six feet deep and three to four feet apart. 2¼ inches in diameter, charged with one, two, or sometimes three cartridges, 1½ inches in diameter, and nine inches long (one to two pounds). About 1,500 cubic yards of rock were thus taken out.

The caisson was lighted with electric light by a dynamo capable of running 75 incandescent lamps of 16 candle power.

During the sinking, the caisson took a slight twist, causing some cracks in the masonry, then about six feet high upon it. Provisions had been made in the dimensions of the base of the pier for small movements of the caisson, and from the time the masonry was brought to normal dimensions no perceptible movement took place.

The compressors used for the sinking of the caisson were one single 12 × 18 inch Delamater, one duplex 10 × 16 inch Delamater, and one duplex 9 × 10 inch Clayton compressor, all operated by two horizontal boilers of 60 and 80 horse power.

Sinking was commenced on November 15th, 1886; and on April 17th, 1887, the caisson reached its final depth, 40·6 feet below mean high water. The few points where the cutting edge did not rest upon the rock were excavated and filled with concrete. It was then sealed and filled two feet deep with concrete formed of Portland cement with two parts of sand and four of broken stone. The remainder of the concrete filling was made with Rosendale cement. The masonry, carried to a height of 27·5 feet, the level of mean high water, during the sinking of the caisson, was continued and completed to the top of the skew-backs, 52·2 feet above high water, by July 17th, the cornice and skew-backs being set and ready for the iron.

At a depth of 43 feet the rock, when tests with 24 and 26 tons to the square foot showed no signs of yielding, the excavations were then suspended; a bed of concrete 6 feet in thickness, made with Portland cement, was laid and the masonry was commenced. This, as in the other piers, was made with a facing of heavy granite blocks and an interior of concrete.

The ends of all the piers are vertical. The long faces of the main piers below the springing line batter three-quarters of an inch to the foot.

* Abstracts from advance proofs of "The Washington Bridge"—a description of its construction by Wm. R. Hutton, Chief Engineer. Illustrated with sixty-three albertypes and lithographs. Published by Leo Von Rosenberg, 35 Broadway, New York. Copyrighted.

Above the skew-backs, piers I. and III. are cellular in construction with walls six and seven feet thick at the base and uniformiy 4 feet, thick at the top, their height above this level being nearly 100 feet.

Pier II. above the skew-backs was built of concrete with two vertical cells, each 10 feet × 10 feet, to a height of 132 feet above tide-level, where arrangements are made for the anchorages of the pier beams, which take the wind pressures from the metallic arches.

All the main piers are faced with granite ashlar, backed with rubble masonry or concrete, with granite quoins 2 feet × 3 × 6. In one cell of each pier iron ladders reach from the skew-backs to the roadway.

The arches of the abutments are semi-circular, of 60 feet clear spans a length between faces of 80 feet 8 inches. The voussoirs of the faces are of granite all feet in depth, except the keystones, and alternately, 4 and 6 feet long. The interior voussoirs are of granite or gneiss, 2 feet 2 inches deep at the crown, and 3 feet 6 inches at the joint inclined 30 degrees. Below this this they are of variable depth and bonded into the rubble masonry of the spandrils. These are built solid to 12 or 14 feet above the impost.

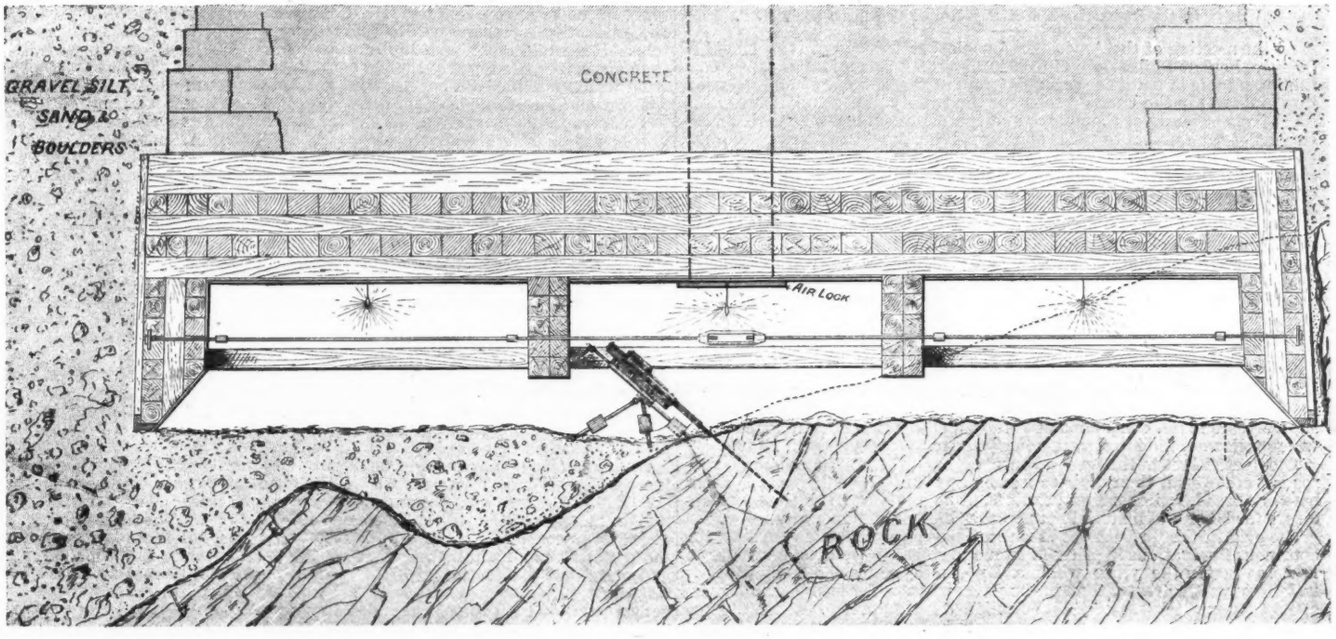
The masonry arches were commenced in September, 1887, and not closed to a height of 10 or 12 feet above the impost before the centering for the arch was placed.

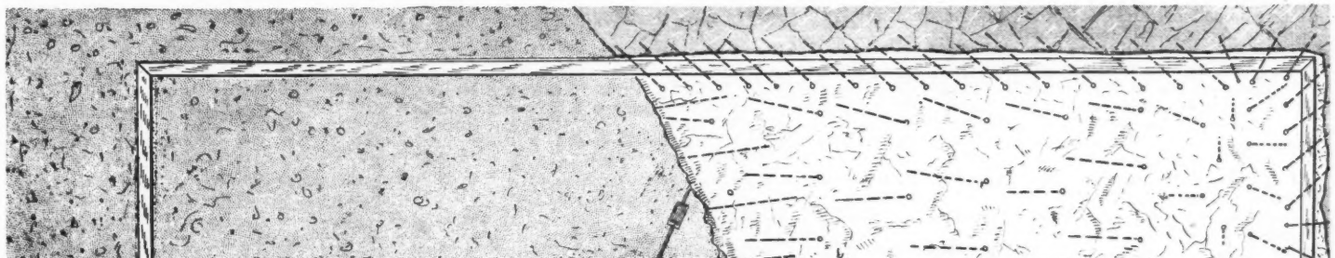
The centers were not struck, but simply allowed to stand until, by the action of the weather, they were found to be free. No perceptible settlements took place.

Each of the steel arches is composed of six ribs with free ends resting upon pins. The clear span between piers is 510 feet; the rise from apparent springing line to soffit, 91¼ feet. The ribs are of a nearly uniform depth of 13 feet, and are composed each of a web-plate of mild steel three-eighths of an inch in thickness, with double flanges at top and bottom, and stiffeners of angle iron at intervals of about 5 feet.

Each rib is formed of 34 segments of such length that the horizontal projection of the extrados of each segment is 14 feet 11¼ inches—the distance between centers of the posts which stand upon the joints and carry the roadway.

Each rib rests at its ends upon pins of forged steel, 34 inches long and 18 inches in diameter. The pins lie in steel bearings, which are carried by pedestals made of plates and angles upon a base of two super-imposed ¾-inch steel plates, 13 feet by 4 feet 4 inches, resting upon and bolted to





CAISSON FOR PIER FOUNDATION OF WASHINGTON BRIDGE. SCALE: ⅛ INCH TO 1 FOOT.

until March, 1888. Some 700 cubic yards of arch masonry was hoisted 75 to 100 feet and set in nine days with a single derrick and steam hoister. Portland cement was used in setting the arch stones, as it is injured much less than the native cements by the low temperature prevailing during this period. Very few of the arch stones, however, were set when the thermometer was below freezing. For the spandril masonry salt was dissolved in the water used in making mortar, and when the thermometer was near zero. Fahrenheit, no masonry was laid.

Over the arches four longitudinal walls of rubble masonry extend through the abutments and the adjoining piers, and with the side walls, divide the interior five longitudinal chambers, which are covered by brick arches supporting the roadway. These arches were built upon centers which, when a section was completed, were slightly lowered and pushed forward for building the next section, sliding upon wooden plates at the springing line. As they were built, they were backed and leveled up with concrete or rubble masonry.

The change in number of arches from two to seven and the entire roadway of the abutments dependent upon them made it necessary to erect centering for all of them at the same time, that every delay might be prevented. The centres used were strong, and contained an excess of material; the height might might have been considerably reduced. The contractor set in several instances the arch stones of the adjacent arch to the granite skew-backs. To secure uniformity of bearing and close contact, wool felt filled with asphalt is interposed between the pedestal and the granite. The ribs are connected by lateral bracing on both top and bottom flanges, and by sway bracing on the segment joints—all of steel latticed beams and angles.

The transverse floor-beams, spaced about 15 feet, are built of plates and angles 2 feet 6 inches deep under the carriage-way. They are supported from the extrados of the ribs by posts rigidly attached to the flanges of the ribs, to the horizontal longitudinal struts, and to the floor-beams, and are connected and braced transversely in two sets of three each by horizontal struts and diagonal ties, all pin-connected.

The transverse floor-beams carry longitudinal stringers—rolled "I" beams, all spaced 3 feet between centers.

The flooring is formed of buckle-plates, which rest upon the longitudinal stringers and are riveted to them They are made generally of plates 3 feet wide and 15 feet long, swedged cold into shape, and forming in one piece 5 flat domes. The metal is three-eighths of an inch thick and they are crowned 2 inches. To transmit the wind-pressure to the masonry piers and to permit the metallic flooring to expand and contract freely, the end-stringers and the buckle-plates at each end of each span are riveted to a vertical transverse beam, on the lower flange of which an offset is built 3½ inches high, with planed vertical faces looking outward and about 12½ feet apart. This rests in a cor-

responding recess in a short, strongly-built beam firmly secured in the masonry. A pier beam of iron plates is anchored to the masonry of the pier, and attached to the movable beam by means of a trough of plate iron which opens or closes as the metallic structure contracts or expands. The floor, fixed to the arch at the middle of the span, slides at both ends upon the masonry, and lateral movement is prevented by the short, wide offset on its under side, confined in a corresponding recess fastened to the masonry.

To allow for the slight vertical movement of the end post under changes of temperature, the end sections of the cornice are attached by bolts in oval holes, the other end being supported on the masonry of the piers. The base and the rail of the end panel of the parapet slide freely in the half posts of bronze fastened to the masonry parapet. All contacts with the masonry are made by bronze parts to prevent discoloration by iron rust. The entire cost up to that date was as follows:

Paid to contractors	$2,648,784.56
Engineering and superintendence	162,400.00
Expenses of commissioners' office	40,500.00

A THIRTY YEARS' RETROSPECT OF THE IRON TRADE.

Written for the Engineering and Mining Journal by William Kent, M. E.

At the meeting of the American Association for the Advancement of Science, held at Philadelphia in 1884, the writer presented a paper containing a table of statistics and a diagram of the production and prices of iron and steel in the United States for the twenty-four years, 1860 to 1883, inclusive. A study of the figures and the diagram, together with a comparison of the number of miles of railroad built in each year, and the estimated cost of such railroad, led to the conclusion that the great depressions in business in the years 1873 to 1877 and 1 83 to 1885 were chiefly caused by irregularity in railroad building. The difference between the cost of the railroads built in the year 1872 and those built in the year 1875 was calculated to be not less than $240,000,000, and the decreased expenditure for labor in building them and in producing the materials used in their construction and equipment was equivalent to the discharge of an army of half a million men from remunerative employment. The decrease of the amount of capital invested was greater than the whole amount of the capital invested in all the iron works or in all the cotton mills in the country. It was equal to more than half the value of our total exports in 1870, equal to our total exports to Great Britain in 1880, and more than equal to our total export of wheat in 1880.

Coincident with the decline in railroad building there was a great falling off in immigration, from 437,750 persons, in 1872, to 130,502, in 1887. In five years more, coincident with the rapid increase in railroad building which followed, the immigration increased to 730,349 persons.

The fluctuations in the expenditure of capital in the building of railroads were greater than those caused by any difference in crops, either here or abroad, in imports and exports, or by any difference in the expenditure for labor and material in any other branch of human industry.

The evils of the fluctuations in railroad building were intensified by the enormous fluctuations in prices of iron and steel, as well as in wages of labor, so that in the years when a large mileage was built the cost per mile was vastly greater than in the years when there was a small mileage. The only cause that could be assigned for these fluctuations was the "insanity of capital," which leads men to build railroads when they cost most to build, and not to build them when they cost the least.

The figures have now been extended to include the year 1889, thus presenting a condensed review of the production and prices of pig iron and of iron and steel rails for 30 years.

The miles of railroad built, the number of immigrants, and the production of pig iron in Great Britain are also given for comparison.

The plotted diagram made from the figures by the graphical method tells the story more plainly. The figures are taken chiefly from the admirable reports of the secretary of the American Iron and Steel Association, Mr. James M. Swank. The production of iron and rails is given in net tons of 2,000 pounds, as is customary in American statistical tables. The British figures, originally given in tons of 2,240 pounds, have been reduced to tons of 2,000 pounds for proper comparison.

The prices are for the ton of 2,240 pounds, the usual ton of the iron market. The price of pig iron is the average of No. 1 Foundry at Philadelphia, and the price of rails the average price delivered at mills in Pennsylvania.

A study of the table and the plotted diagram will show the following facts :

1. *Railroad Building.*—From 1860 to 1889, inclusive, 132,448 miles of railroad were built. From a minimum of 651 miles built in 1861, the yearly rate of building, at first slowly and then more rapidly, increased until 1871, when 7,379 miles were built. It then decreased to 1,711 miles in 1875, and then, again, at first slowly and then more rapidly, increased to 11,569 miles in 1882, then decreased to 2,930 miles in 1885, then rapidly increased to the maximum of 12,872 miles in 1887, and decreased to 5,155 miles in 1889. The figures may be arranged into six periods, as follows:

Years of slow railroad building. Year.	Miles.
1860	1,846
1861	651
1862	834
1863	1,030
1864	738
1865	1,177
1866	1,716
1867	2,449
1868	2,979
Average for 9 years	1,493
1874	2 117
1875	1,711
1876	2,712
1877	2,280
1878	2,679
Average for 5 years	2,300
1884	3,924
1885	2.930
Average for 2 years	3,427

Years of rapid railroad building. Year.	Miles.
1869	4,615
1870	6,070
1871	7,379
1872	5,878
1873	4,097
Average for 5 years	5,608
1889	4,817
1880	6,712
1881	9,847
1882	11,569
1883	6,743
Average for 5 years	7,938
1886	8,100
1887	12 872
1888	6.801
1889	5,155
Average for 4 years	8,232

2. *Iron Rail Production.*—The production of iron rails increased from a minimum of 190,000 tons in 1861 to 906,000 tons in 1872, then decreased steadily to 323,000 tons in 1878, increased to 494,000 tons in 1880, and decreased to only 65,000 tons in 1883. The iron rail industry is now practically extinct, steel rails being sold cheaper than iron rails can be made.

3. *Steel Rail Production.*—The steel rail industry, beginning in the United States in 1867 with the small amount of 2,550 tons, increased steadily until 1874, when 145,000 tons were produced, and then began a wonderful development, by which the production increased nearly tenfold in eight years, reaching 1,438,000 tons in 1882. The first decrease in the history of the manufacture took place in 1883, when 1,287,000 tons were produced. The decrease continued till 1885, when only 1,079,000 tons were made. A rapid increase then took place, corresponding to the increase in railroad building, nearly 2,400,000 tons being made in 1887. A sharp decrease to 1,558,000 tons took place the next year, a slight recovery being made in 1889, to 1,695,000 tons, notwithstanding the decrease in railroad building that year.

4. *Total Rail Production.*—Adding together the production of iron and steel rails, the total rails made in the United States increased from 190,000 tons in 1861 to 1,000,000 tons in 1872. A decrease of 27 per cent. took place in the two years following, and in seven years, from 1874 to 1881, the production increased over 150 per cent., to a maximum of 1,844,000 tons. It then decreased steadily for four years to 1,094,000 tons in 1885, then again increased nearly 130 per cent. in two years to 2,396,000 tons, from which maximum it has declined to 1,704,000 tons in 1889.

5. *Importation of Rails.*—The importation of rails (the statistics beginning in 1867) reached a maximum of 566,000 tons in 1871, more than 1,000,000 tons being imported in the two years 1871 and 1872. After 1872 a rapid decrease took place, to 19,000 tons in 1875, and then for the three years 1876, 1877 and 1878 the importation practically ceased, only 332 tons being imported in three years. It began again in 1879, reached 386,000 tons in 1881, decreased rapidly to 39,000 tons in 1883, practically ceased again in 1884 and 1885, revived in the next three years, reaching 154,000 tons in 1887, and declining again to 7,000 tons in 1889.

6. *Total Rail Consumption.*—Adding together the total production of rails in the United States and the importation, we have the approximate consumption. The exact figures of consumption each year cannot be given, since the statistics take no account of stocks carried over from one year to the other. The approximate consumption, thus estimated, increased from 625,000 to 1,530,000 tons, or 150 per cent., from 1867 to 1872, decreased nearly 50 per cent., or to 764,000 tons, from 1872 to 1877, and then increased nearly 200 per cent., or to 2,230,000 tons, in 1881. It decreased again more than 50 per cent., or to 1,096,000 tons, in 1885, and again increased nearly 150 per cent., or to 2,550,000 tons, in 1887, from which maximum it has decreased to 1,711,000 tons in 1889.

7. *Production of Pig Iron.*—The pig iron produced in the United States increased nearly fourfold, or from 731,000 to 2,868,000 tons, between 1861 and 1873. A decrease of 25 per cent. took place between 1873 and 1876, and an increase of 150 per cent. between 1876 and 1882. The high figures of 1873 were not again reached until 1879. The production for 1882 was more than five and a half times that of 1860, seven times that of 1861, and more than double that of 1871. A decrease from 5,178,000 to 4,530,000 tons took place from 1882 to 1885, but in 1886 the figures of 1882 were passed by more than 20 per cent., and the increase which began in that year has continued without interruption to the present time, the product amounting to over 8,50 ,000 tons in 1889.

In the first half of 1890 the production was 5,169,737 net tons, so that the total production for the year will probably exceed 10,000,000 tons, and for the first time surpass the production of Great Britain.

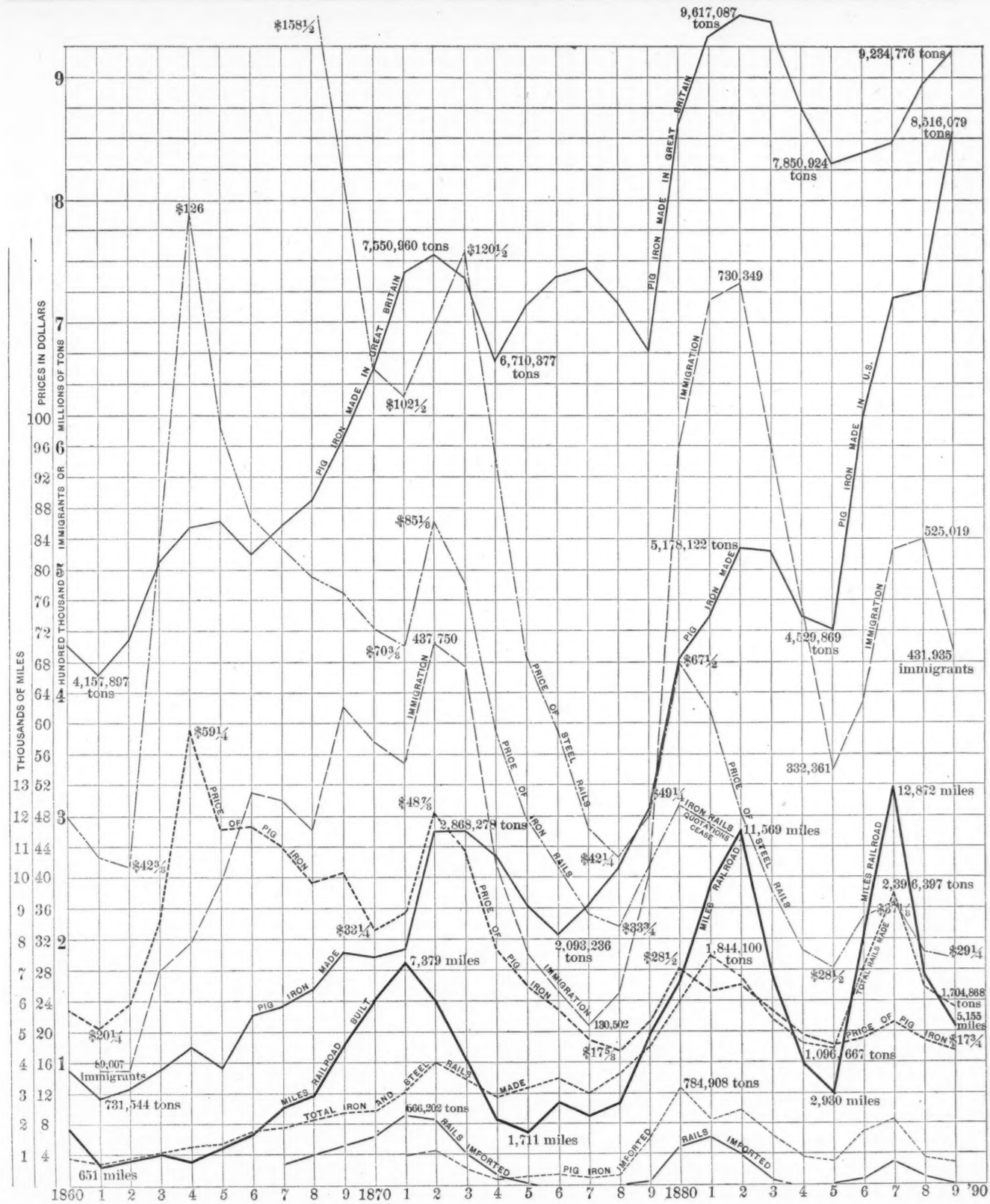
8. *Wrought Iron other than Rails.*—The rolled iron other than rails produced in the United States increases much more regularly than any other of the iron and steel products already considered, the production doubling in ten years from 1864 to 1874 by comparatively regular yearly increments. A decrease of about six per cent. took place in 1875 and 1876, when a steady increase took place and continued until 1883; a decrease of more than 20 per cent. took place in the next two years, but in the next year, 1886, the decrease was made up, and a rather irregular increase set in, which continues to the present date. The increase in the product of wrought iron is quite remarkable in view of the fact that it is being steadily superseded by Bessemer and open-hearth steel for many purposes.

9. *Prices.*—The prices of pig iron, iron rails and steel rails fluctuate in nearly the same manner as do the figures of production. If we except the years prior to 1870, during which prices of all kinds were influenced by the price of gold, or depreciation of the paper currency, it will be noticed that the increase of production is nearly coincident with increase of price and decrease of production with decrease of price, both periods of rapid railroad building being coincident with periods of maximum production and of maximum price, and the periods of diminished building of railroad, 1874 to 1878, inclusive, 1884 and 1885, being also the periods of decreased production and of low prices. A most notable exception to the general rule of decrease of production of pig iron being coincident with decrease of railroad building and with decrease of price is found in the years 1888 and 1889, when, although railroad building decreased over 50 per cent. and prices of pig iron decreased 15 per cent. almost to the minimum price reached in 1878, yet the production of pig iron increased enormously. This increase of production of pig iron, in spite of decrease of railroad building, is one of the most remarkable facts in the whole history of the trade, and it will be referred to at greater length hereafter.

10. *Immigration.*—The periods of large and of small immigration are closely coincident respectively with periods of great and of small increase of railroad mileage, with maximum and minimum iron production, and with high and low prices of iron products. The plotted line in the diagram representing immigration shows a remarkable approximation to the lines representing yearly increase of railway mileage and pig iron production, with the exception that in 1889 there is a decrease of immigration coincident with increased production of pig iron, the decrease in railroad building, as before, apparently checking the immigration.

Reviewing the whole field, as shown in the plotted diagram, the period of thirty years, from 1860 to 1889, inclusive, may be divided into six periods, each having strongly marked characteristics :

First.—The period of moderate development, from 1860 to 1868, inclusive, in which railroads built, pig iron and rails produced and number of



immigrants all increased at a comparatively even rate. In this period the fluctuation of prices (currency) appears to vary rather on account of fluctuations in the price of gold than on account of varying supply of or demand for iron.

Second.—The first period of violent development, 1869 to 1873, inclusive, in which railroad building, pig iron and rail production, importation, prices and immigration all enormously increased, the period culminating in the building of 7,379 miles of railroad in 1871; in the production of over 2,800,000 tons of pig iron in each of the years 1872 and 1873; in the production of 1,900,000 and the importation of 1,000,000 tons of rails in two years; in prices of pig iron and of iron rails more than double those of 1860, and in the unprecedented immigration of 437,750 persons, or nearly five times the number in 1860.

Third.—The period of long depression, 1874 to 1878, inclusive, characterized by small yearly increase of railroad mileage, diminished production and greatly diminished prices of pig iron and of rails by nearly stationary production of rolled iron other than rails by greatly diminished immigration, and by the almost absolute cessation of rail importations. In this period the production of steel rails increased (due to a remarkable development and cheapening of the Bessemer process), but the production of iron rails diminished more rapidly than that of steel rails increased, so that the total rail production was diminished.

Fourth.—The second period of violent development, from 1879 to 1883, inclusive, characterized by rapid increase in railroad building, in production of pig iron, production and importation of rails, in immigration and in prices. The prices of iron and steel rails and of pig iron more

STATISTICS OF PIG IRON, RAILS, ETC., FROM 1860 TO 1889, INCLUSIVE.

YEAR.	Miles of railroad built.	Iron rails made in United States. Net tons.	Steel rails made in United States. Net tons.	Total rails made in United States. Net tons.	Rails imported. Net tons.	Approximate rail consumption. Net tons.	Pig iron made in United States. Net tons.	Pig iron imported. Tons of 2,000 lbs.	Total steel ingots made in the United States (including crucible). Net tons.	Rolled iron except rails, made in the United States. Net tons.	Prices per ton of 2,240 pounds. Pig iron.	Iron rails.	Steel rails.	Pig iron produced in Great Britain. Tons of 2,000 pounds.	Immigration. Number of persons.	Year.
1860	1,846	205,038	None.	205,038	136,836	341,874	919,770	80,178	.....	.....	$22¾	$48	.....	4,285,962	.....	1860
1861	651	189,818	None.	189,818	83,429	273,247	731,544	82,909	.....	.....	20¼	42⅜	.....	4,157,877	89,724	1861
1862	834	213,912	None.	213,912	9,644	223,556	787,662	24,921	.....	.....	23⅞	51¾	.....	4,416,685	89,007	1862
1863	1,050	275,768	None.	275,768	19,139	294,907	947,604	34,729	.....	.....	35¼	76⅞	.....	5,051,245	174,524	1863
1864	738	335,369	None.	335,369	132,960	468,329	1,135,996	114,490	.....	536,958	59¼	126	.....	5,340,049	193,195	1864
1865	1,177	356,292	None.	356,292	86,820	443,112	931,582	56,730	.....	500,048	46⅛	98⅝	.....	5,397,564	247,453	1865
1866	1,716	430,778	None.	430,778	87,368	518,146	1,350,343	114,679	.....	595,311	46⅞	86¾	.....	5,066,764	314,917	1866
1867	2,449	459,558	2,550	462,108	163,049	625,157	1,461,626	125,487	.....	579,838	44⅛	83⅛	.....	5,332,346	310,965	1867
1868	2,979	499,489	7,225	506,714	250,081	756,795	1,603,000	125,590	30,000	598,286	39¼	78⅞	$158½	5,566,631	289,145	1868
1869	4,615	583,936	9,650	593,586	313,163	906,749	1,916,641	153,412	35,000	642,220	40⅝	77¼	132¼	6,099,248	385,257	1869
1870	6,070	586,000	34,000	620,000	399,153	1,019,153	1,865,000	171,677	77,000	705,000	33¼	72¼	106¾	6,679,137	356,303	1870
1871	7,379	737,483	38,250	775,733	566,202	1,341,935	1,911,608	245,535	82,000	710,000	35⅛	70⅝	102½	7,422,440	346,938	1871
1872	5,878	905,930	91,070	1,000,000	530,850	1,530,850	2,854,558	295,967	160,108	941,992	48⅞	85½	112	7,550,960	437,750	1872
1873	4,097	761,062	129,015	890,077	258,772	1,148,849	2,868,278	154,708	222,652	1,076,368	42¾	76⅝	120½	7,354,425	422,545	1873
1874	2,117	584,469	144,944	729,413	108,311	837,724	2,689,413	61,165	241,614	1,110,147	30¼	58¾	94¼	6,710,377	260,814	1874
1875	1,711	501,649	290,863	792,512	19,448	811,960	2,266,581	66,457	436,575	1,097,867	25½	47¾	68¾	7,129,317	191,231	1875
1876	2,712	467,168	412,461	879,629	287	879,916	2,093,236	83,072	597,174	1,042,101	22¼	41¼	59¼	7,342,717	157,440	1876
1877	2,280	332,540	432,169	764,709	35	764,744	2,314,585	66,861	637,972	1,144,219	18⅞	35¼	45½	7,501,704	130,502	1877
1878	2,679	322,890	550,398	882,685	10	882,695	2,577,361	74,484	819,814	1,232,686	17⅝	33¾	42¼	7,146,777	153,207	1878
1879	4,817	420,160	683,964	1,113,273	44,147	1,157,420	3,070,875	340,672	1,047,506	1,627,324	21½	41¼	48¾	6,714,787	250,565	1879
1880	6,712	493,762	954,460	1,461,837	290,689	1,752,526	4,295,414	784,968	1,397,015	1,838,906	28⅛	49¼	67½	8,679,141	593,703	1880
1881	9,847	488,581	1,330,302	1,844,100	386,321	2,230,421	4,641,564	520,835	1,778,912	2,155,346	25½	47⅛	61⅝	9,382,648	72 ,045	1881
1882	11,569	227,874	1,438,155	1,688,794	224,127	1,912,921	5,178,122	604,978	1,945,095	2,265,957	25¾	45⅛	48½	9,617,082	730,349	1882
1883	6,743	64,954	1,286,554	1,360,694	38,977	1,399,671	5,146,972	361,366	1,874,359	2,283,920	22⅜	Not quoted	37¾	9,552,816	570,316	1883
1884	3,924	25,560	1,119,291	1,144,851	3,168	1,148,019	4,589,613	206,381	1,736,985	1,931,747	19⅛	.....	30¼	8,749,134	461,346	1884
1885	2,930	14,815	1,079,400	1,094,215	2,452	1,096,667	4,529,869	164,349	1,917,350	1,789,711	18	.....	28½	8,305,325	332,361	1885
1886	8,100	23,679	1,768,922	1,792,601	46,578	1,839,179	6,365,328	405,180	2,870,093	2 259,943	18¾	.....	34½	8,850.924	392,887	1886
1887	12,872	23,062	2,373,335	2,396.397	154,369	2,550,766	7.187,206	523,625	3,739,760	2,565,438	21	.....	37⅛	8,463.660	516,933	1887
1888	6,801	14,252	1,557,892	1,572.144	70,602	1,642,746	7,268,507	220,905	3,247,373	2,397,402	18⅞	.....	29⅝	8,958,845	525,019	1888
1889	5,155	10,258	1,694,610	1,704,868	6,960	1,711,830	8,516,079	159,298	3,792,020	2,576,127	17¾	.....	29¼	9,234,776	431,935	1889

than doubled between January, 1878, and February, 1880, reaching their extraordinary maximum in the culmination of the "boom" at the latter date, between one and two years before the production of pig iron and rails, and immigration, reached their maxima for that period. In 1882 the production of pig iron and of steel rails reached a figure which was not again reached till 1886.

Fifth.—The short period of depression, the two years 1884 and 1885, when railroad building was less than one-third of that of 1881 and 1882, production of pig iron decreased 12 per cent., prices of pig iron declined 30 per cent. below the average figures of 1882, and 36 per cent. below those of 1880, and immigration fell off from 730,349 in 1882 to 332,361 in 1885. The fortunate thing about this period of depression was that it was a short one. Production, prices, railroad building and immigration did not go as low as they did in the long period of depression, 1874 to 1878, inclusive. As prices were not so high before the depression as they were in 1872, they did not have so far to fall, and therefore the depression caused less disaster to business.

Sixth.—The period of rapid but not violent development, which is still in progress.

The beginning of this period was in 1886, when the number of miles of railroad built was 8,100 as compared with 2,930 miles in 1885, and when the production of pig iron increased in one year from 4,529,869 tons to 6,365,328 tons. The condition in 1885 was in general similar to that in 1878, when railroad building, production and prices of iron, and immigration were all at a low ebb, and, judging from the experience of the boom of 1879, a similar boom might have been expected in 1886. But there was one most important condition in which 1885 and 1878 were altogether dissimilar, namely, the preparation of the iron works for meeting a sudden increase of demand. In the long depression between 1874 and 1878 there was a stagnation not only in production but in preparation to produce. Old furnaces long out of blast were allowed to fall into ruin, the substitution of steel for iron rails had caused many old rail mills to be dismantled and abandoned, and in but very few even of the larger works were any adequate preparations made for the demand for railroad material which came suddenly in 1879. The same was true in the development of iron ore and coal mines, of coke ovens, and of facilities for transporting material. So in 1879 the country was obliged to import great quantities of iron ore and pig iron, causing a rise in the price of iron all over the world, and an actual famine in Connellsville coke took place, so that the price at the ovens rose from 90 cents to $5.00 per ton. Within one year, however, after the beginning of the boom of 1879 so great was the rapidity of building new blast furnaces and rolling mills and the repairing and starting of old ones, the opening and developing of mines and the building of coke ovens, that the capacity of production was brought up to the demand, and prices fell to a normal level.

The building of new works and the development of mines have continued steadily from 1879 to the present time, so that at no time since 1880 has there been any deficiency either in the ore or fuel supply or in the producing capacity of the works. In consequence of this increase in capacity there has been, notwithstanding the tremendous increase in railroad building, from 2,930 miles in 1885 to 12,872 miles in 1887, and in production of pig iron from 4,529,869 tons in 1885 to 8,516,079 tons in 1889, no great increase in prices. During the six years, 1883 to 1889, inclusive, the average yearly prices of pig iron has varied only between $22⅜ and $17¾ per ton, and steel rails only between $37¾ and $28¼ per ton. The fluctuations in prices of steel rails have followed the fluctuations in railroad building, as they have done ever since 1871, but they have not been so violent as in former years, the increase in railroad building, from 2,930 miles in 1885 to 12,872 miles in 1887, causing a rise in price of rails of from $28½ to $37¾ per ton, and the decrease to 5,155 miles in 1889 causing a decline in price to only $29¼ per ton. *(To be Continued.)*

SOCIETIES.

AMERICAN INSTITUTE OF MINING ENGINEERS.

The following programme has been issued by the Secretary of the American Institute of Mining Engineers, covering the New York meetings of the Institute together with the meetings of the British Iron and Steel Institute in New York and the International meeting in Pittsburg.

The fifty-seventh meeting of the Institute will be held in the city of New York, beginning Monday, September 29th, at two o'clock.

All sessions will be held in Chickering Hall, 130 Fifth Avenue. Hotel headquarters will be at the Park Avenue Hotel, 482 Fourth Avenue.

The following programme is announced:

Sessions of the Institute on Monday afternoon and evening and Tuesday morning, afternoon, and evening Hours of meeting, 10 A. M., 2 P. M., and 8 P. M.

On Wednesday, Thursday, and Friday mornings the sessions of the British Iron and Steel Institute will take place. The sessions of both societies will be public.

On Wednesday afternoon there will be an excursion of the two societies and invited guests upon the Hudson River.

On Thursday, at 4 P. M., the Holley memorial will be unveiled in Washington Square. The commemorative address will be delivered at 2 P. M., in Chickering Hall, previous to the open-air ceremony, by Mr. James Dredge, editor of London *Engineering*.

On Saturday, members and guests will proceed by special train to Philadelphia; on Tuesday, October 7th, to Lebanon and Harrisburg, and on Wednesday to Johnstown and Altoona, arriving Wednesday evening at Pittsburg, according to the programme of the General Reception Committee.

At Pittsburg two joint international sessions will be held by the two societies and their guests for the reading of papers.

Special programmes will be issued by the local committees of New York, Philadelphia, Pittsburg, and the principal points to be visited in the general excursions.

The general excursion will proceed from Pittsburg to Chicago, and at the close of the visit to Chicago will divide into two parties, going respectively north and south. According to the programme of the General Reception Committee, the northern excursion will visit the Menominee, Gogebic and Marquette iron ranges and the Lake Superior copper district, returning to New York via the Sault Ste. Marie Canal, the Sudbury (Canada) nickel and copper mines and Niagara, while the southern excursion will go from Chicago to Birmingham, Shelby and Anniston, Ala., returning to New York via Chattanooga, Tenn., Middlesbrough, Roanoke, Cripple Creek iron mines and Pocahontas coal mines, Luray, Va., and Washington. Both excursions will reach New York about October 28th.

The following papers are announced:

FOR THE MEETING OF THE AMERICAN INSTITUTE OF MINING ENGINEERS.

Monday Afternoon, September 29th.—"Explosions from Unknown Causes," by J. C. Bayles, East Orange, N. J "Cast-Iron Tools for Cutting Metals," by Oberlin Smith, Bridgeton, N. J. Also the following papers, which will be read by title and distributed in pamphlet form at this session: "Magnetic Concentration at the Michigamme Iron Mine, Lake Superior," by John C. Fowle, Michigamme, Mich. "Ore Dressing by Electricity at the Tilly Foster Mine," by F. H. McDowell, New York City. "The Magnetization of Iron Ore," by Clemens Jones, Hokendauqua, Pa. "The Ball and Norton Monarch Magnetic Separator," by C. M. Ball, Troy, N. Y. (A working model of this machine will be exhibited in the hall.)

Monday Evening.—"The Iron Mountain Mine," by W. B. Potter, St. Louis, Mo. "American and Foreign Practice with the Diamond Drill," by W. F. Durfee, Birdsboro, Pa. (These two papers will be illustrated with lantern views.)

Tuesday Morning, September 30th.—"Physical and Chemical Equation

of the Open-Hearth Process," by H. H. Campbell, Steelton, Pa. "Wire-Rope Tramways," by J. Pohlig, Cologne, Germany. "Water-Gas in Europe," by E. Blas, Essen, Germany. "Electric Power-Transmission in Mining Operations," by H. C. Spaulding, Boston, Mass. Also the following papers, which will be read by title and distributed in pamphlet form at this session: "Amalgamation at the Comstock Lode, Nevada; a Historical Sketch of Milling Operations at Washoe, with an Account of the Treatment of Tailings at the Lyon Mill, Dayton," by A. D. Hodges, Jr., Boston, Mass. Notes on the excavation of the New York aqueduct, by J. P. Carson, New York City.

Tuesday Afternoon.—"Notes on Recent Improvements in German Steel Works and Rolling Mills," by R. M. Daelen, Düsseldorf, Germany. "American Rolling Mills," by R. W. Hunt, Chicago, Ill. "Machinery for the Charging of Heating and Melting Furnaces," by S. T. Wellman, Thurlow, Pa. Also the following papers, which will be read by title and distributed in pamphlet form at this session: "A Suspended Feed Table for Rolling Mills," by James Morgan, Pittsburg, Pa. "Pneumatic Hoisting," by H. A. Wheeler, St. Louis, Mo. "The Walker Anti-Vibration Regulating Shutter or Slide for Guibal or other Enclosed Fans," by Edward R. Walker, Weybridge, England. "The Department of Metallurgy and Economic Geology in the National Museum," by F. P. Dewey, Washington, D. C. "Notes on Coal Mining in Oregon," by R. H. Norton, Portland, Oregon. "The Resources of the Black Hills and Big Horn Country, Wyoming," by H. M. Chance, Philadelphia, Pa. "The Potosi, Bolivia, Silver District," by Arthur F. Wendt. New York City. "The Pratt Mines of the Tennessee Coal, Iron, and Railroad Company," by Erskine Ramsay, Pratt Mines, Ala. "The Paint Mines of Lehigh Gap, Pennsylvania," by C. E. Hesse, Bethlehem, Pa. "Methods and Apparatus for Boring and Operating Oil Wells," by J. C. Boyce, Pittsburg, Pa. "Commercial Analyses of Lake Superior Iron Ores," by George W. Goetz, Milwaukee, Wis.

Tuesday Evening—"The Copper Resources of the United States," by James Douglas, Jr., New York City. "The New York Aqueduct," by A. Ftely, New York City. "The New Iron Breaker at Drifton, with Remarks on the Preparation of Anthracite Coal," by Eckley B. Coxe, Drifton, Pa.

These three papers will be illustrated with lantern views.

In addition to the foregoing list the following papers have been accepted and will be read by title and subsequently printed: "The Ensley Blast Furnace," by J. S. Kennedy, Ensley, Ala. "A Study of the Economies Effected by Modern Improvements in Mining," by R. P. Rothwell, New York City. "Coal Mining and Coke Making in Tennessee," by James J. Ormsbee, Tracy City, Tenn. "The Gogebic Range," by J. Parke, Channing, Ishpeming, Mich. "Latest Developments in Compressed Air Motors for Tramways," by D. S. Jacobus, Hoboken, N. J.

The presidential address will be delivered by Hon. A. S. Hewitt at the opening of the session of the Iron and Steel Institute, on Wednesday morning, October 1st.

FOR THE MEETING OF THE IRON AND STEEL INSTITUTE.

Wednesday, Thursday and Friday Mornings, October 1st, 2d and 3d: "The Development of American Blast-Furnaces, with Special Reference to Large Yields," by James Gayley, Bessemer, Pa. "The Manufacture of Bessemer Steel in the United States," by H. M. Howe, Boston, Mass. "Recent Progress in the Manufacture of War Material in the United States," by W. H. Jacques, Bethlehem, Pa. "The Wear of Metal, as Influenced by its Chemical and Physical Properties," by Dr. C. B. Dudley, Altoona, Pa. "Fuel Gas and Some of its Applications," by Burdett Loomis, Hartford, Conn. "The Manufacture of Spirally-Welded Steel Tubes in the United States," by J. C. Bayles, East Orange, N. J. "The Thomson Electric-Welding Process," by Prof. Elihu Thomson, Boston, Mass. "Testing Materials of Construction in the United States," by Messrs. Hunt and Clapp, Pittsburg, Pa. "The Coke Industry of the United States," by J. D. Weeks, Pittsburg, Pa. "The Development of the Iron Manufacture of Virginia," by E. C. Pechin, Cleveland, O. "The Massicks and Crooke Hot-Blast Stoves," by Walter Crooke, Millom, Cumberland. "Aluminum Steel," by R. A. Hadfield, Sheffield, England.

FOR THE PITTSBURG INTERNATIONAL SESSIONS.

Thursday Morning, October 9th: "The Probable Future of the Manufacture of Iron," by Sir Lowthian Bell, Bart., F. R. S., Middlesbrough. "The Protection of Iron and Steel Ships against Foundering from Injury to their Shells, including the Use of Armor," by Sir Nathaniel Barnaby, K. C. B. (late Chief Constructor of H. M. Navy), London. "Development of the Marine Engine, and the Progress made in Marine Engineering during the past Fifteen Years," by A. E. Seaton, M. I. C. E., M. I. M. E., Council I. N. A., Hull.

Friday Morning, October 10th: "The Progress of German Practice in the Metallurgy of Iron and Steel since 1876, with Special Reference to the Basic Process," by Dr. Hermann Wedding, Berlin, Germany. "The Recarburization of Basic Steel by Pure Carbon," by Alexander Thielen, Rührort, Germany. "Transportation as an Element in the Iron and Steel Manufacture," by W. P. Shinn, Pittsburg, Pa. "The Iron Ores of the United States," by Dr. T. Sterry Hunt, New York City. "International Standards for the Analysis of Iron and Steel," by Prof John W. Langley, Pittsburg, Pa.

It is expected that the papers of this session will not be read in full, but distributed in pamphlet form at the session.

Electric Drills.—At Earle's shipbuilding and engineering works, at Hull, great use is being made of electric drills to drill holes 2⅜ inches in diameter through the 2¼-inch steel projectile decks of H. M. S. "Endymion" and "St. George." One of these holes can be drilled by an electric drill in 21 minutes, while in the Royal Dockyard at Devonport it takes two men half a day to drill similar holes in a similar ship.—*Electrical World.*

Xyolithe.—A new artificial building material has been brought out in Germany, under the name of Xyolithe. It is a mixture of sawdust and certain chemicals, compressed into blocks at an immense pressure. Without losing the lightness of wood, it possesses the hardness of stone, and is at the same time a good fire-resisting substance. It is being used for the construction of portable houses intended for erection on the West Coast of Africa.—*St. Louis Mechanic and Tradesman.*

Metal Ceilings.—Heretofore the extended use of metal ceilings has been limited by the ornateness of design, high grade of skilled labor necessary to satisfactory erection and consequent cost. This difficulty has been solved and journeymen carpenters picked up in New Rochelle, N. Y., who had never before seen a metal ceiling, have just done this class of work for the government. An inspection of the alignment of the moldings shows them to be perfectly straight. A New York firm of architects has specified, among other building materials of one of their great buildings, for 34,000 square feet of this ceiling. Judging from the success in the first year of its introduction, acres of the ceiling will be used, involving tons of sheet metal, adding another great and growing field for the output of our mills.—*American Manufacturer.*

PATENTS GRANTED BY THE UNITED STATES PATENT OFFICE

The following is a list of the patents relating to mining, metallurgy, and kindred subjects, issued by the United States Patent Office:

TUESDAY, SEPTEMBER 9TH, 1890.

435,914. Device for Replacing Cars on Railroad Tracks. John B. Bennett, Jersey City, N. J.
435,918. Trucks for Cars. Amasa B. Clark, Chicago, Ill.
435,923. Engine Governor. Wilber Dennis, Minneapolis, Minn.
435,927. Combined Pipe-Coupling and Expanding Metallic Sleeve. John Ginty, San Diego, Cal.
435,936. Method of Making Glass. Francois Lannoy, Tiffin, O.
435,940. Compound for Converting Wrought Iron and Steel. William J. Miles, Jr., Kansas, Ill.
435,955. Machine for Cutting and Shaping Heated Metal. John W. Waller, Bescott, County of Stafford, England.
435,956. Car Coupling. George W. Wallingford, Mount Gilead, Ky.
435,970. Steam Engine. Adolf Hjelte, Chicago, Ill., Assignor to himself, John P. Johnson and Peter A. Lind, all of same place.
435,973. Machine for Channeling Rock. Edward H. Kruger, Buffalo, N. Y.
435,9 2. Regulator for Dynamo-Electric Machines. William Stanley, Jr., Great Barrington, Mass.
435,983. Electrical Traction Apparatus. William Stephens, Santa Rosa, Cal.
435,989. Boiler. Charles E. Wakeman, Pontiac, Mich.
435,990. Steam Separator. Henry C. White, New York, N. Y., Assignor to George A. Barnard, same place.
435,992. Machine for Drawing Cold Metal Rods or Shafts. Thomas J. Bray, Warren, O.
435,994. Valve Gear. Ludwig Czischek, Vienna, Austria, Hungary.
436,008. Dredge Bucket Chain. Arthur W. Robinson, Bucyrus, O.
436,017. Power Transmitting Device. Edward A. Jarvis, Paterson, N. J.
436,019. Car Coupling. Patrick McEntee, Montgomery, Minn.
436,023. Electric Detonator or Primer. Henry J. Smith, Paterson, N. J.
436,027. Steam Ore Stamp. Charles W. Tremain, Portland, Ore.
436,033. Steam Boiler. Gilbert A. Colby, Chicago, Ill.
436,036. Elevator for Water, Sand, etc. Alexander Hogeland, Lincoln, Neb.
436,037. Track Laying Apparatus. Robert E. Hurley, Chicago, Ill.
436,057. Automatic Brake for Cars. George E. Gillam, Macomb, Ill., assignor of one-half to William Prentiss, same place.
436,067. Car Coupling. Frederick L. Habliston, Richmond, Va.
436,068. Steam Engine. Daniel E. Kempster, Boston, Mass.
436,071. Electric Switch. Charles G. Perkins, Hartford, Conn.
436,113. Magneto Electric Machine. La Motte C. Atwood, St. Louis, Mo., assignor to the Atwood Electric Company, same place.
436,115. Pipe Coupling. Henry Balbian, Philadelphia, Pa.
436,119. Electric Soldering Iron. Charles E. Carpenter, Minneapolis, Minn., assignor to the Carpenter-Nevens Electric-Heating Company, same place.
436,138. Steam Boiler Furnace. Allen R. Jones, Milwaukee, Wis.
436,140. Friction Clutch. Seabourne F. Kerslake, Turner's Falls, Mass.
436,148. Steam Dynamo Electric Machine. Edward C. Newton, Little Rock, Ark.
436,164. Hydraulic Governor. Edgar J. Wood, Brooklyn, N. Y.
436,181. Submarine Mining Machine for Dredging and Separating the Precious Metals. John A. Mathews and Hiram T. Scurry, Vancouver, British Columbia, Canada.
436,190. Hoisting Apparatus George W. Rawson, Cambridge, Mass.
436,193. Reversing Gear. George C. Roberts, Chicago, Ill., Assignor to the Troy Laundry Machine Company, Troy, N. Y.
436,216. Device for Operating Oil Wells. William M. Copeland, Stewart's Run, Pa.
436,219. Electric Valve Controller. Harry W. Deeds, Indianapolis, Ind.
436,227. Apparatus for Extracting Oils with the Aid of Solvents. Walter T. Forbes, Atlanta, Ga.
436,232. Pump. Louis J. Genett, Marquette, Mich., Assignor of one part to Frederick Frei, Peter Frei and Herbert Moore, all of same place.
436,244. Method of and Apparatus for the production of Mineral Wool. William H. Kennedy, Etna, Pa.
436,245. Valve for Hydraulic Elevators. August Kieckhefer, Milwaukee, Wis.
436,260. Car Coupling. Charles H. Pierce, Rossville, Ill.
436,285. Ore Concentrating Machinery. John C. Garvin, Leadville, Colo., Assignor by direct and mesne assignments, to the Garvin Ore Reduction Company, of Colorado.
436,291. Water Wheel. Adolphe Patrick, Maskinonge, Canada.

TUESDAY, SEPTEMBER 16TH, 1890.

436,836. Car Coupler. John Chestnut, Martinsburg, W. Va.
436,340. Ore Roasting Furnace. Simon B. Dexter, Glendale, Mont.
436,346. Car Coupling. Joseph E. Francis, Thornhill, Canada.
436,349. Pulverizing Machine. Ryerson D. Gates, Chicago, Ill., assignor to the Gates Iron Works, same place.
436,355. Car Journal Box. Edward W. Mackenzie-Hughes, Chicago, Ill., assignor to himself and Edward N. Dickerson, New York, N. Y.
436,393. Slide Valve for Engines. Seward S. Babbitt, Pittsburg, Pa.
436,394. Steam Engine Governor. Seward S. Babbitt, Pittsburg, Pa.
436,414. Tower for Condensing Acid. Charles Graham, Brooklyn, N. Y.
436,430. Car Coupling. William McRae, Montreal, Canada.
436,437. Hydrocarbon Burner. Edwin A. Rider, Racine, Wis.
436,441. Rail Joint. William A. Sweet, Syracuse, N. Y.
436,461. Apparatus for Tapping Furnaces. James Purves, Homestead, Pa.
436,463. Die for Making Spiral Tubing. Fred. J. Richard, Waterbury, Conn., Assignor to Randolph & Clowes, same place.
436,476. Ore Concentrator. Thomas J. Hatch, Denver, Colo.
436,491. Mud Valve for Steam Boilers. Joshua B. Barnes, Springfield, Ill.
436,497. Steel Alloy. Robert Hadfield, Sheffield, England; Joseph D. Weeks, ancilliary administrator of said Robert Hadfield, deceased.
436,519. Method of Electrically Heating Bars, etc., for Welding and Working Purposes. Mark W. Dewey, Syracuse, N. Y., Assignor to the Dewey Corporation, same place.
436,558. Rock Drill. John L. Buckingham, Hermosa, S. D.
436,572. Rail Joint. James J. Anderson, Chicago, Ill., Assignor of one-half to Noel Brosseau and E. D. Norton, same place.
436,574. Pipe Coupling. William Bramwell, Toledo, Ohio.
436,613. Method of Supplying Furnaces with Carbonaceous Fuel. Richard N. R. Phelps, N. Y., Assignor to Calvin R. Cheever, same place.
436,628. Flask for Foundry Practice. William E. Hughes, Washington, D. C.
436,660. Car Coupling. William H. Harris, Newberry, S. C., Assignor to Holmes & Harris, same place.
436,675. Well Drilling Apparatus. George Siebens, Storm Lake, Iowa, Assignor of one-third to the Pech Manufacturing Company, same place.
436,709. Tie Plate for Railways. Henry Holgate, Innisfil, Ontario, Canada.
436,732. Hoisting and Loading Apparatus. John R. Dalton, Hammond, Wis., Assignor to Albert R. Starkey, St. Paul, Minn.
436,750. Friction Brake for Cars. John Wyckoff, Charles W. Lunquist and Michael J. Smith, Minneapolis, Minn., said Lunquist and Smith Assignors to Chas. G. Laybourn, same place.

PERSONAL.

Mr. T. H. Heist, who has been spending ten days in Joplin, Mo., looking after his mining interests, left on the 21st inst. for his home in Harrisburg, Pa.

Mr. Michael Fackenthal has resigned as superintendent of the Copley Iron Works, at Bethlehem, Pa., and goes to manage the Roanoke Iron Works, Virginia. He is succeeded by Mr. Thomas Boyd, of the Thomas Iron Works, at Fullertown, Pa.

Ex-Senator Palmer, President of the World's Fair Commission, has announced the following Committee on Mines and Mining: F. J. V. Skiff, Colorado, Chairman; M. H. Day, South Dakota; L. T. Baxter, Tennessee; J. W. St. Clair, West Virginia; J. W. Woodside, Pennsylvania; A. H. Mithchell, Montana; L. Lowndes, Maryland; G. Russell, Nevada; F. G. Bromberg, Alabama; J. E. Stearns, Idaho; G. F. Coats, Arizona; C. H. Richmond, Michigan; P. H. Lannan, Utah; H. Drum, Washington; R. M. White, New Mexico; M. L. McDonald, Commissioner-at-large.

OBITUARY.

John Cribbins, one of the best known miners in California, died at Deadwood, Dak., on the 13th, inst. About three years ago he went to South America, where he was connected with the El Callao mine. Since his return he has been in feeble health.

Arthur J. Stace, professor of civil engineering at Notre Dame University, died at Notre Dame, Ind., on the 25th inst. Professor Stace was born in Sussex, England, in 1838. He had been connected with the University of Notre Dame since 1860. He was a gifted man, achieving distinction both as a litterateur and mathematician. Professor Stace was one of the commissioners to the Paris Exposition of 1889.

Robert Dunbar, of Buffalo, N. Y., died on the 18th inst., aged 77 years. He was an expert mechanical engineer, proprietor of the Eagle Iron Works, and was the father of the present system of grain elevators. His inventions and improvements in elevators are known all over the world. He built most of those in Buffalo, also designing elevators at Liverpool and Hull, England, and Odessa, Russia, besides New York and other points in this country and Canada.

INDUSTRIAL NOTES.

Machinery is being placed in the new rolling mill at Fort Wayne, Ala.

The Fort Payne Furnace Company, at Fort Payne, Ala., has blown in its new furnace.

The Gracey-Woodward Iron Company has commenced work on its new furnace at Clarksville, Tenn.

The Schenectady Locomotive Works, Schenectady, N. Y., are now turning out thirty locomotives per month.

The Keystone Machine Company, of Williamsport, Pa., will soon remove its machine works and foundry plant to Goshen, Va.

The Roane Iron Company, at Rockwood, Tenn., is adding new machinery to its furnace. O. L. Hurlbut has been elected secretary of the company.

The two large furnaces of the Watts Steel and Iron Company, at Middlesborough, Ky., which it is estimated will cost $490,000, are rapidly nearing completion.

Messrs. Holibaugh & Van Ness, mining engineers, of Joplin, Mo., have dissolved partnership. Mr. Holibaugh has now associated with him Mr. Stealey, a mining engineer. The firm will be known as Holibaugh & Stealey.

The last of the four large blast furnaces of the De Bardeleben Coal and Iron Company, at Birmingham, Ala., was blown in last week. The furnace is known as the "King John's" furnace, and has a capacity of 150 tons.

The Tonawanda, Pa., Iron and Steel Company will resume operations again about the last of October. The Brown Hoisting and Conveying Machine Company, of Cleveland, O., has built a hoist for it for the handling of ore, 32,000 tons of which have been ordered for this season's delivery.

The buildings at the Hercules Iron Works, at Aurora, Ill., are finished. The company will soon have the machinery in place. The buildings are composed of brick and stone, and comprise a machine shop, foundry and office. The products of these works are steam engines, ice machines, etc.

About three months ago the factories of Bellaire, O., and a number of business men subscribed about $4,000 for the testing of an invention for producing fuel gas which Capt. J. L. Gearing, of Pittsburg, Pa., warranted to be a good thing, and to cost not over 3 cents per 1,000 feet. The new plant is now ready to make gas.

In consequence of the retirement of Mr. E. J. Waring from the management of the New York branch of the Hall Steam Pump Company, the metropolitan office will be discontinued after September 30th, and the business of the company will be transacted at the Pittsburg, Pa., office. Mr. Waring has been appointed general manager and treasurer of the Rossendale Belting Company.

The Pennsylvania Tube Works Company is constructing manufactured gas producers at its works, as it has been troubled since last winter by shortages in the natural gas supply. Coal gas can be made at a cost not greater than the present rates for natural gas, but the latter is preferred because of the inconvenience of handling coal and ashes.

Manufactured gas is used with satisfactory results at the Riverside Iron Works, at Wheeling, W. Va., by the Warren Tube Company, of Warren, O., and by the Syracuse Tube Works, Syracuse, N. Y. These all use the system adopted by the Pennsylvania Tube Works. At none of these places is coal any cheaper than in Pittsburg.

A fine specimen of coal cut exactly square, and weighing 800 pounds, has been set under a huge glass case in the office of the Berwind-White Coal Mining Company, 55 Broadway, New York. It is a specimen of the company's Eureka lump steam coal, the supply of which is mostly shipped to the West Indies and South American ports.

The National Rolling Mill, of McKeesport, Pa., in several of its departments, is about ready to return to the use of coal. The scarcity of natural gas in McKeesport has caused many mill workers to move away, as they could not get regular work. The McKeesport water-works will return to the use of coal. Several mills are also likely to do this.

The Bethlehem Iron Company, of Bethlehem, Pa., has called a meeting of the stockholders to consider the matter of increasing the capital stock from $3,000,000 to $5,000,000. This proposed increase is to be spent in additions to the works, which include the new ordnance works, where armor and guns are turned out for the Government.

In the Pittsburg Court, Thursday, a judgment of $183,000 against the Iron City Bridge Company was formally entered on public records in favor of the Oliver Steel Company. This company indorsed notes given by the defendants. These notes were to fall due at different times. The bond was given that in case of failure to pay the notes as they came due a judgment of $183,000 was to be entered against the Bridge company. This company defaulted on the first note, for $2,677, due September 19th, hence the judgment. The Oliver Steel Company, it is said, is protected by attachments.

Our issue of the 13th contained a brief account of a power equipment at the Treadwell mill in Alaska, but we inadvertently neglected to mention that it was the Pelton wheel that made such an extraordinary showing in the way of power and efficiency. The work there accomplished by a single jet of water only 3½ inches in diameter is of so remarkable a character that it has attracted wide attention and illustrates most forcibly the energy of water as applied on the Pelton wheel, as well as the economical and reliable character of such power.

Messrs. Pierce & Thomas, of New York, have received an order for eight 100 H. P. boilers from Messrs. Rodgers & Clement, contractors, equipping the Niagara Falls Tunnel. They are also executing an order of $13,000 for their special new economizer boilers, with engines, for a large phosphate plant in Florida. The Chateaugay Ore and Iron Company, of New York, has also contracted with them for an iron concentrating mill, including the "Brennan" ore crushers and "Brennan" new Cornish crushing rolls, twenty-four of which are in the concentrating mill equipment which the same firm has furnished for Edison's mill.

Elmore's French Patent Copper Depositing Company, Limited, has been formed, in London, England, with a capital of £200,000, shares of £2 each. The object is to enter into and carry into effect an agreemeet which has already been prepared and is expressed to be made between Elmore's Foreign and Colonial Patent Copper Depositing Company, Limited, of the first part, Woodhouse and Rawson United, Limited, of the second part, and the company of the third part, to carry on in France and elsewhere, at such places as the directors of the company shall think fit, the business of manufacturers of and dealers in copper and other metals, to carry on the business of supplying electricity in all its branches, and in particular to erect or acquire any works or other structures requisite or convenient for the purposes of the companies, and to carry on the business of electricians and suppliers of electricity, and of manufacturers and dealers in all apparatus required for or capable of being used in connection with the generation, distribution, supply, accumulation and employment of electricity.

CHICAGO INDUSTRIAL NOTES.

(From our Special Correspondent.)

The London and Chicago Contract Corporation is now a certainty. It is organized under English law; also under the laws of the State of Illinois. All the English directors have been chosen, and the London shares are all subscribed for. Its capital is $4,000,000, and the bulk of the American capital comes from Chicago. The holders of the founders' shares in London, in connection with investment companies, it is said, represent $50,000,000. The company will undertake the issue of corporation and other loans on the London, New York and Chicago markets, and the conversion of commercial and other firms into corporations to issue and guarantee the subscription of their securities, and also to do a general financial business.

The National Commission this week located the exposition grounds on the Lake front, Jackson Park, Washington Park and the Midway Plaisance, the aggregation comprising 1,186 acres. This final settlement of the site question will give very generalsatisfaction.

DENVER INDUSTRIAL NOTES.

At a recent meeting of the manufacturing and mercantile bureau in the Charles Block, Denver, Mr. J. W. Nesmith read a paper on the steel interests of Colorado and the establishment of a large steel plant in Denver, of which the following is an abstract:

The iron resources of Gunnison County have been investigated by Prof. Regis Chauvenet of the Colorado State School of Mines, and are, according to his report for 1887, rich enough to warrant a thorough development. Analyses of these iron ores gave:

	I.	II.
Iron, metallic	58·75	69·32
Silica	3·85	2·80
Phosphorus	0·044	0·039
Sulphur	0·123	0·084

Limestone of most suitable character for flux is abundant.

Coal contained: Water 1·18, volatile matter 28·39, fixed carbon 67·06 and ash 3·37; coke made from coal: water 0, fixed carbon 90·71, volatile matter ·42 ash 8·87, sulphur ·37; and anthracite coal: water 1·58, volatile matter 5·66, fixed carbon 89·76, ash 3·00.

The quantities of ore and coal are practically unlimited, easy of access, and found so closely together that all the material for the production of a ton of Bessemer pig iron, delivered at a suitably located furnace, would only cost between $8 and $9. By adding to this for labor $2; for repairs and expenses $1 and for freight to Denver $2, Bessemer pig iron could sell in Denver at $15 per ton with a fair profit; a prominent manufacturer with large iron interests in the South and West estimates the cost at even less than $12 per gross ton.

To establish only iron works and furnaces would require a smaller investment than the $5,000,000 proposed, but it could not be recommended to use the available high grade Bessemer ores for competition with the South, where pig iron is produced at lower cost than in any other section on this continent, but only such pig as is suitable for foundry and mill purposes, but no steel at all. The erection of a steel plant would be specially preferable in view of the rapidly increasing demand for steel compared with iron. While thus in 1886 about 259,000 tons of iron cut nails and about 178,000 of steel cut nails were produced in the United States in 1889, only three years later there were produced only 89,000 tons of iron and 312,000 tons of steel nails, the latter representing in 1886 40 per cent. of the whole, and in 1889 78 per cent. And so in all industries steel has made most rapid gains, though in no other so rapid as in nails, except in rails, of which now none are made of iron.

The first step which Mr. Nesmith advocated to be taken was to organize a company with sufficient cash capital to lease or purchase iron ore deposits and develop them to an extent that would absolutely justify the expectations and the outlay of five millions of dollars necessary to establish steel and iron works on a scale commensurate with the importance of the situation.

Considering that the enormous growth of Chicago is largely due to that of her iron industry and this again to the recent development of the iron ore mines of the Lake Superior region, and that this ore is not superior or better adapted to the manufacture of Bessemer steel than the ores in Colorado, and is far away from coal beds, the development of the Colorado mines which are close to abundant fuel, is likely to inaugurate for Denver a period of similar expanse and prosperity, as the iron industry within a radius of between 200 and 300 miles naturally would be concentrated there.

After the lecture was delivered, and a motion made that a committee be appointed to get up complete statistics of the iron and coal interests in the State, to be used in future as reference for persons seeking information for investment, a committee of five was appointed to induce the English mining engineers who will meet at Pittsburg on October 7th, with the national association of mining engineers of New York, to look over the coal and iron industries of the State.

CONTRACTING NOTES.

The Baldwin Locomotive Works, of Philadelphia, Pa., have received the contract for building four decapod tank locomotives for service in the St. Clair tunnel.

The Dominion Government has contracted with the Pictou Foundry Company, Pictou, N. B., for the construction of six fog alarm appliances, to be placed at important Canadian headlands for the benefit of navigation.

Messrs. Schaw, Ingraham, Batcher & Co., of Sacramento, Pa., will establish works for the manufacture of plate iron pipe for conveying water. They recently received a contract for supplying 2½ miles of 22-inch pipe.

MACHINERY AND SUPPLIES WANTED AT HOME AND ABROAD.

If any one wanting Machinery or Supplies of any kind will notify the "Engineering and Mining Journal" of what he needs, his "Want" will be published in this column.

Any manufacturer or dealer wishing to communicate with the parties whose wants are given in this column can obtain their addresses from this office.

No charge will be made for these services.

We also offer our services to foreign correspondents who desire to purchase American goods, and shall be pleased to furnish them information concerning American goods of any kind, and forward them catalogues and discounts of manufacturers in each line, thus enabling the purchaser to select the most suitable articles before ordering.

These services are rendered gratuitously in the interest of the subscribers and advertisers; the proprietors of the "Engineering and Mining Journal" are not brokers or exporters, nor have they any pecuniary interest in buying or selling goods of any kind.

GOODS WANTED AT HOME.

1,069. Correspondence with parties able to furnish artesian water under quarantee. Texas.

1,070. A large iron cylinder saw 3 feet at one end, 2½ feet at the other and 4 feet long. Florida.

1,075. Engine, boiler, clay tons, brick presses and all machinery necessary for fire brick works. Kentucky.

1,076. Electric light plant, North Carolina.

1,077. A small planer and matcher. North Carolina.

1,078. Brass furnaces, both reverberatory blast; also traveling cranes, etc. Wisconsin.

1,079. Cotton mill machinery, including spinning and weaving. North Carolina.

1,080. Bids on one 100 horse power boiler, one 95 horse power engine, 500 feet shafting, hangers, pulleys, etc. Virginia.

1,081. Electric plant to pull coal out of coal mines. Tennessee.

1,082. Bids on an electric light plant. Virginia.

1,083. Prices on about 5,000 lineal feet of 4-inch curbing, both on 14 and 16 inches wide, in lengths not less than 4 feet. Florida.

1,084. Illustrated catalogues and price lists of manufacturers of charcoal retorts whereby a by-product is made, such as alcohol and acetate of lime. Louisiana.

1,085. Rails, cars and all other necessary equipment for a street railway three miles long. South Carolina.

AMERICAN GOODS WANTED ABROAD.

1,086. Names of firms that are manufacturing vitrified paving bricks somewhere near a stream or sea coast from where they could be shipped to Florida. Florida.

1,087. A full line of machinery for manufacturing wagons and buggies. Alabama.

1,088. Iron roofing and siding for planing mill. Tennessee.

1,089. A first class modern engine from 350 to 400 H. P. Ohio.

1,090. A lath machine, bolter, and cut-off saw. Tennessee.

1,091. Machinery for separating sand from kaolin, other than by water process. Georgia.

1,092. Three or four miles of 25 or 30-pound steel rails in good shape for relaying. Arkansas.

1,093. Complete plant for smelting works of about 50 tons capacity per 24 hours, for silver and copper ore, to be packed in small sections, convenient for mule-back transportation. Peru.

1,094. Hickory pick handles. England.

1,095. Clothes pins, broom handles and shoe pegs. England.

GENERAL MINING NEWS.

Shipments of iron ore from the mines of the districts mentioned below for the season up to and including September 17th were as follows:

			Tons. 1890.	Tons 1889.
Marquette,	Marquette	District,	1,007,196	1,073,892
St. Ignace,	"	"	15,911	36,447
Gladstone,	Marquette	District	6,183	713,881
"	Menominee	"	47,877	14,950
Escanaba,	Marquette	"	934,457	31,957
"	Menominee	"	1,463,867	1,194,595
"	Gogebic	"	217,804	263,223
Ashland,	"	"	1,611,794	1,175,773
Two Harbors'	Vermillion	District	689,687	658,453
Total, tons			**5,985,776**	**5,163,171**

ALABAMA.

DE KALB COUNTY.

FORT PAYNE COAL AND IRON COMPANY.—This company has put in a coal crusher and washer at its plant at Fort Payne.

TUSCALOOSA COUNTY.

New coal mines are being opened at Milldale, on the Birmingham mineral railroad.

WALKER COUNTY.

The coke ovens at Jasper have been shut down for some time, but it is reported that they are soon to be started up again.

HORSE CREEK COAL & COKE COMPANY.—This company has commenced work on the construction of its 500 coke ovens at Horse Creek.

ARKANSAS.

MARION COUNTY.

(From our Special Correspondent.)

YELLOWVILLE, Sept. 15.

Mining operations in Marion county show a decided improvement. Work on the Big Elephant is showing good pockets of both desseminated zinc and lead. The zinc claims of Jas. M. Hamilton & Co., on Water Creek show a fine workable ledge in soft rock. The development will be pushed.

The Missouri & North Arkansas has been developing its property, which is located on the head of Wild Cat. At Boot Creek the Le Marshal Company has struck ore after a years' prospecting. The work will be pushed. In a short time a crusher will be put up by the Shoney Consolidated Mining and Milling Company, of St. Louis, on Jimmy Creek.

The onyx mine showed up a bed 18 feet wide and from 10 to 12 feet thick, exposed for a distance of 50 feet in a fissure vein. The mineral takes a fine polish and is easily sawed and dressed. The streaks of orange and red are very beautiful. There are good zinc prospects on Musick Creek, also abundant supplies of water for power. The railroad problem is being agitated on all sides. Railroad surveys are being crowded now into this mining country. There is to be a race for the big traffic in ore, timber and marble. The A. T. & Santa Fe and Jay Gould are both going to try for the business.

CALIFORNIA.

AMADOR COUNTY.

PLYMOUTH CONSOLIDATED GOLD MINING COMPANY.—Mr. H. W. Lazelle, Secretary of this company, has submitted the following financial statement to Sept. 1:

Surplus January 1, 1890		$28,141.42
Gold bullion produced March		2,969.90
From Utica Mining Co., for use of mill		542.52
Wood sold		1,004.00
Gold bullion produced April		5,055.63
" " May		6,040 37
" " June		7,572.05
" " July		5,649.93
Copper plates melted up		1,770.95
Gold bullion produced August		6,359.07
Total		$65,105.84
January expenses	$3,975.05	
February "	3,762.57	
March "	4,293.19	
April "	5,075.63	
May "	6,443.17	
June "	5,961.37	
July "	7,733.65	
August "	5,523.90	
		$42,768.53
Surplus		$22,337.31

BODIE COUNTY.

STONEWALL CONSOLIDATED MINING COMPANY.—The superintendent of this company estimates that there is sufficient ore in sight, assaying from $15 to $45 per ton, to keep the 20 stamps of the mill in steady operation for 12 months to come. Mr. W. H. Oscanyan, vice-president of the company, stated to a representative of the ENGINEERING AND MINING JOURNAL that Superintendent Macy sends favorable reports. He is at work in the mill on $15 ore. The old pan process has been discarded and plates are used, which is somewhat of an innovation in Bodie.

INYO COUNTY.

A strike is reported on the ridge south of Deep Springs Lake. There is said to be three feet of ore that goes 172 ounces of silver per ton and 68 per cent. lead.

NEVADA COUNTY.

BRUNSWICK CONSOLIDATED GOLD MINING COMPANY.—Mr. H. R. Lounsbery, treasurer of this company, has received from Superintendent Fitzgerald a letter, from which we abstract the following extracts: "Work at the mine is progressing. I still have the ledge in the shaft. It varies from 1½ feet 6 inches and carries sulphurets. I am now in soft rock which is seamy and breaks readily, and if it holds out will soon sink the 100 feet. I am now down 40 feet of it and expect to make from 1 foot to 1½ feet per day, and perhaps more; it all depends on the nature of the rock. A force of eight men is employed. A reduction works are now being built about a quarter of a mile from the mine by a Scotch company, which purposes to buy quartz containing sulphurets.

SAUVE.—The owners of this mine, near the Empire, at Grass Valley, have decided to sink the winze from the tunnel at a point about 600 feet from the mouth, a distance of 50 feet, if the pay shoot is not struck before.

SHASTA COUNTY.

The contemplated sale of the Texas and Georgia mines is said to have fallen through, for the reason that there is no U. S. patent to the ground.

GLADSTONE.—The sale of this group of mines in French Gulch district is reported for $50,000. A 20-stamp mill is to be erected.

COLORADO.

BOULDER COUNTY.

It is said that there is considerable talk at Caribou just gow among mining men of having the old Caribou mine pumped out, preparatory to active development work. Seven hundred feet of water is now in the mine, and it is estimated that it would take from $8,000 to $10,000 to get the property in good condition.

CLEAR CREEK COUNTY.

PAY ROCK SILVER MINING COMPANY.—According to reports, the sale of the Pay Rock mines, near Silver Plume, for which negotiations have been pending for some months, to an English syndicate, is completed. The new company is to be called the Pay Rock Silver Mining Company, Limited, and is to have a capital of £200,000, shares of a par value of £1 each. It is stated that £25,000 are to be paid into the treasury, to belong equally to all shareholders in proportion to the shares held; £500 to be paid when contracts were signed; £7,500 to be paid 30 days after first allotment of shares. The balance of purchase money to be paid in Denver on or before November 15, 1890. Deeds to be passed when final payment is made. The company receives for its property $300,000 in cash, $300,000 in new stock, and $125,000 is to be placed in the treasury. The result of the sale will be that each shareholder will receive 7 cents in cash for his stock, and the same amount of stock at the par value of £1 per share. In other words, those who now hold stock will receive about 14 cents per share. The stock has been selling at from 5 to 7 cents for months. On November 1 the London company will take possession.

HINSDALE COUNTY.

CARSON CAMP DISTRICT.

(From our Special Correspondent.)

LAKE CITY, Sept. 19.

The new and promising district of Carson Camp, situat d on the Continental divide, about 16 miles south of Lake City, has attracted more than usual attention the past season. Recent development is proving its mines to carry a superior grade of ores. The section is comparatively new, and with two exceptions it is not until within the past year that the value of its ore bodies have been proven by systematic work. The most serious drawback to the rapid opening up of its mineral deposits has been the extremely wet nature of the formation. The mineral belt of the district lies in a poorly drained basin, directly on the divide of the range. Hence the development of the camp must depend on the introduction of machinery. This is necessarily slow, as everything must be taken into the district by pack animals. A road is now being built to the camp and will undoubtedly be completed this fall, so we may consider the feature of inaccessibility only a temporary handicap.

GEORGE THE THIRD MINING COMPANY.—The latest strike in the camp is in the Annie, recently purchased by this company. It was made early last week, and is proving one of the most important ever made in the county. At a depth of 50 feet a streak of solid ore 2 feet wide was cut; it is slowly but steadily growing larger. Two men take out and sort an average of 40 sacks per day. Supt. Cory has a pack train busily engaged packing the ore to the road. The value, as shown by mill runs, is about $130 per ton, and as no grade sorting is required, 1,500 pounds per day to the man makes a big profit for work.

HAMILTON.—This is the oldest mine in the camp. It has been idle for years. The owners were compelled to suspend operations on account of water. It is announced that it will be extensively operated this fall. The paystreak varies in width from four to fourteen inches and the mineral is remarkably rich. In a record of over 20 tons shipped from the mine the lowest grade ran $580 per ton, while one lot of three tons returned $5,200.

ST. JACOBS.—At the present time this is the most important mine of Carson. It is working under lease. New and commodious buildings have just been finished and the lessees will hereafter work the property on an extensive scale. The plan of operations includes sinking the shaft and driving of levels, as well as driving a new cross-cut tunnel, intended to cut the vein about 75 feet deeper than the present workings. For the 18 tons of ore shipped $5,560 were received. Forty tons were shipped under a former lease. They yielded a net return of over $8,000. The average of the ore is over $500 per ton for first-class and about $150 per ton for second class.

PITKIN COUNTY.

(From an Occasional Correspondent.)

Mr. J. R. Holden, of Denver, has closed a contract with the Russell Process Company for the exclusive right to use the Russell Process at

Aspen, Colo. For about a year and a half Mr. Holden has been engaged in experimenting with the Aspen ores, and in the beginning of September, 1890, 50 tons of Aspen ore were treated at the Ontario mill, Park City, Utah, to find out if this ore could be roasted successfully in a Stetefeldt furnace.

The plan for a lixiviation-plant of 100 tons capacity per day will be drawn by Behr & Salweld and C. A. Stetefeldt, of San Francisco, and construction of the mill will be commenced in spring, 1891. The plant will consist of Stetefeldt's shelf dry kiln and furnace, both fired by producer—gas generated in a Taylor producer; stamps for dry crushing of ore and salt, and a lixiviation-plant especially constructed for the Russell process.

Power will be supplied by a Pelton wheel. This will be the first model lixiviation plant erected in the West.

IDAHO.

ALTURAS COUNTY.

HIDDEN TREASURE.—This mine has had considerable work done upon it, and shows a good deal of ore. In the shaft, at a depth of 138 feet, the ore-vein is three feet thick; in a tunnel driven 130 feet west of the shaft, there is a thickness of two feet of ore. The chute is therefore, at least, 160 feet long by 150 feet in depth. The first work to be done, says the Wood River *Times*, will be to connect the tunnel with the shaft for air. Then men will be put to work to stope to the surface. This ore is low-grade, carrying about 70 per cent. lead, and 30 ounces of silver per ton, it is said.

ILLINOIS.

The Executive Board of the United Mine Workers of America has issued a circular to the miners in Illinois directing them to demand an advance of 7½ cents per ton, to take effect on November 1st, and to hold themselves in readiness to suspend operations on the same date if such a measure be deemed necessary to enforce their demands.

KANSAS.

CHEROKEE COUNTY.

A special report shows that during the week ending September 20th the output of ore from the mining district of Galena and Empire City was: Rough ore, pounds milled, 2,009,240; zinc ore, pounds, sold, 979,630; lead ore, pounds sold, 45,280; sales aggregated, total value, $12,821.35; total value of output, $15,763.

MINNESOTA.

ST. LOUIS COUNTY—VERMILLION RANGE.

(From our Special Correspondent.)

DULUTH, Sept. 22.

The Fink explorations on section 15, town 62, range 14 have been discontinued.

No work has been done on the Krelivitz property since spring.

Captain Ross is still exploring on section 10, town 62, range 14. A vertical shaft is being sunk, and two diamond drills are in operation.

MACOMBER.—Work on this property is being actively prosecuted, and it is expected that ore will be shipped another season. The shaft is now down 65 feet, and is to be sunk 200 feet. A drift has been started at the 60-foot level. The new hoisting machinery has arrived, and is in operation. A town site has recently been plotted in the vicinity of the mine.

MINNESOTA IRON COMPANY.—Considerable interest has been awakened here by the report that this property was to be sold to a German syndicate. So far as can be learned the report seems to be without foundation. Shipments from No. 12 shaft have been discontinued for the present, and the shaft is to be put down 100 feet. No. 3 shaft is to be put down 100 feet. It will be the deepest shaft on the property.

MINNESOTA MINING COMPANY.—The shaft which was being sunk by this company on section 16, town 62, range 14, was stopped at a depth of 25 feet. All work except the diamond drilling has been discontinued. The drill is now at work upon its third hole. No valuable iron deposits have yet been struck, but results have been such as to warrant further search.

MISSOURI.

JASPER COUNTY.

(From our Special Correspondent.)

JOPLIN, Sept. 21.

Saturday closed a prosperous week in the lead and zinc mines, notwithstanding the heavy rain causing some of the mines to be flooded. The zinc ore market remained firm during the entire week. Lead advanced to $30 per thousand, and closed with an upward tendency. Several large sales of developed mines are about being closed up. Quite an amount of undeveloped land in both Jasper and Newton counties changed hands during the week.

Following are the sales from the different camps:

Joplin mines, 1,532,105 pounds zinc ore and 251,870 lead; value, $25,148.

Webb City mines, 578,170 pounds zinc ore and 42,400 lead; value, $7,517.59.

Carterville mines, 868,510 pounds zinc ore and 65,370 lead; value, $11,769.96.

Zincite mines, 394,300 pounds zinc ore and 7,400 lead; value, $8,033.

Osonogo mines, 8,660 pounds lead ore; value, $259.80.

Galena, Kan., mine, 979,630 pounds zinc ore and 45,280 lead; value, $12,321.35.

All districts, total value, $65,049.70.

E. B. Allen and J. H. Reyer, of St. Louis, were in Webb City last week looking over the mining and commercial business interests with a view of establishing a new bank to be called the First National Bank of Webb City. They say they met with sufficient encouragement to organize with a capital stock of $100,000.

Pat Murphy made an important strike of lead ore Friday afternoon at a depth of 129 feet on 40 acres of land adjoining the city limits on the southwest. Mr. Murphy selected this tract of land with a view of building himself a fine suburban residence, but now it must give way to shafts and dump piles.

Ashcraft, Reynolds & Co., of Webb City, are putting up a fine plant of machinery on their land north of town; they also made a big strike of lead at a depth of 117 feet.

CRASSWELL MINING COMPANY.—Geo. H. Huchison & Co. consummated a very important deal during last week with Fort Worth and Kansas City cattlemen, by which 160 acres of undeveloped land, 3½ miles east of the city of Joplin, was transferred in consideration of $32,000. The new purchasers organized the above-named company, but have not yet determined on the amount of capital stock. Three shafts are now being sunk. Mr. Hutchison is one of the old timers of Joplin County and has been very successful in placing undeveloped lands that have proved productive with developments.

FRANCESCA MINING COMPANY.—Mr. J. M. Kehlos, superintendent of the Peire mines, on the Empire land, has taken a lease of 40 acres at Webb City and organized this company. Prospect shafts are now being sunk.

RAINBOW MINING COMPANY.—This company, consisting of Hampton Brothers & Gaston, has opened up a large body of lead and zinc ore on the Tracy land at a depth of 143 feet.

SCEMMOLER MINING COMPANY.—Mr. J. M. Kehlos, in company with Mr. B. Gieplin, of Colorado, have leased 40 acres of land, located northwest of the city of Joplin in the old Leadville hollow, and organized this company. At present the land is being prospected.

VICTOR.—These mines, located south of Carterville, operated by Messrs. Young & Arnold, of Joplin, turned in last week 166,760 pounds zinc ore.

MONTANA.

SILVER BOW COUNTY.

ALICE GOLD AND SILVER MINING COMPANY.—The mills and the mines of this company, it is reported, are being run to their full capacity. The Alice mine continues to be developed on the 1,100, 1,200, and 1,300 foot levels. The Blue Wing is taking out its regular quantity of ore and ore is being taken from all the levels of the Magna Charta to the 600.

BOSTON & MONTANA CONSOLIDATED COPPER AND SILVER MINING COMPANY.—The product of this company for the first fourteen days of September amounted to 936,283 pounds of copper and 6,981 ounces of silver.

BUTTE & BOSTON MINING COMPANY.—The depth of 700 feet has been reached in the West Gray Rock and sinking continues below the 600-foot level in the east shaft. The East Silver Bow is down 500 feet. The machinery for the new concentrator is fast arriving and being placed in position.

NEVADA.

ELKO COUNTY.

GRAND PRIZE MINING COMPANY.—The annual meeting of this company was held in San Francisco, Cal., on the 16th inst. The following officers and directors were elected to serve during the ensuing year: I. E. Dixon, president; Thomas Cole, vice-president; Herman Zadig, H. H. Noble, William Bowers. R. R. Grayson was reappointed secretary and H. W. Coffin superintendent. Superintendent Coffin submitted the following report of operations in the mine: "During the past twelve months development work has been confined mostly to the 500-foot level, the water having been lowered to that level and crosscuts run to the north lateral vein, the latter drifted on and prospected. Some milling and a large amount of concentrating ore was extracted from above this level. A small streak of high-grade ore was left showing in the bottom of the north lateral drift. This latter was not prospected downward, owing to the heavy expense which would have to be incurred to lower the water. During the year there have been run 473 feet of crosscuts, 595 feet of drifts and 205 feet of winze. Ore was stoped at different points from the 500-foot level on up to the 200-foot level, producing 8,000 tons of concentrating and some milling ore. The concentrator has run steadily during the year, reducing, besides the 8,000 tons of company ore, 17,357 tons of custom ore, making a total of 25,357 tons. The concentrator was turned on to custom ore on the 5th of last month, and work at the mine discontinued for the time being. Concentrates belonging to the company are now being worked at the Union mill, and the proceeds, together with the receipts for custom ore concentration, will be turned into the company's treasury by the 1st of October, thereby reducing the present indebtedness."

NORTH BELLE ISLE MINING COMPANY.—It is reported that this company has nearly $100,000 worth of ore and ore concentrates ready for working as soon as facilities can be obtained.

UNION MILL COMPANY.—This company, of Tuscarora District, has been organized with the following directors: Thomas Bell, P. C. Hyman, George W. Grayson, E. Scott and F. A. Berlin. Thomas Bell has been appointed president, P. H. Hyman, vice-president, R. R. Grayson secretary and H. W. Coffin superintendent of the mill. The Union mill is owned by the Commonwealth, North Belle Isle and Nevada Queen mining companies, each of which holds in its treasury one-third of the 100,000 shares of the capital stock of the mill company. On October 1st the mill, which is now being run by the Commonwealth Company for the owners, will be turned over to the new company, together with all supplies, etc. The rate for working ore has been established at $25 per ton.

EUREKA COUNTY.

From the year 1864 up to the present time, says the Eureka *Sentinel*, about 4,500 mining locations were recorded in this county, nearly 4,000 of that number having been recorded in Eureka District. A large number of the latter were located during the most prosperous period of the camp, for speculative purposes only, that were never touched with a pick or shovel, but were abandoned. A large number of abandoned claims were several times relocated, and many bona fide claims were partly developed and consolidated or merged into companies. At no time were there ever more than 400 producing claims in the county, and at the close of last year less than 70 mines were producing ore.

STOREY COUNTY—COMSTOCK LODE.

Local papers contain little of importance concerning operations on the Comstock Lode. The weekly report of the different mining companies offer no especially interesting news.

CROWN POINT MINING COMPANY.—The new pumping arrangement on the Sutro Tunnel level of the Crown Point mine, about 1,400 feet below the top of the shaft, has been started into operation with compressed air for motive power, in order to try the joints and connections. Steam will be turned on next, and practical pumping for the reduction of the water will be actively engaged in about the first of next week.

NEW MEXICO.

GRANT COUNTY.

A series of experiments is now being conducted by Mr. W. G. Waring at the Flagler Works at Silver City which may result in the general adoption of an entirely new method of treating ores in the Southwest. The process used has already been patented, and it is said the results obtained since the experiments began at the works on a large scale have been very gratifying. The details of the process have not yet been given to the public, but it is stated that all the refractory ores produced in this section, as far as treated by this process, are readily reduced, no difficulty having been found in treating any ores except those carrying a high percentage of lead. No batteries, amalgamating plates or concentrators are used in the process, but the metals are dissolved out of the ores by chemical action, and held in solution until either precipitated or crystallized out.

Miners have been taking platinum and nickel from the mines at Pinos Altos for 30 years, but these metals occur there in such small quantities that the ores have never been treated for them until an experiment was made by the new process. Most of the ores found at Pinos Altos contain gold, silver, copper, lead, zinc, iron, platinum, nickel, and sulphur. Cobalt and bismuth are also found, but only in certain parts of the camp, and then in very small quantities. The Pinos Altos ores have been and are now being treated principally for the gold and silver they contain, and from 15 to 40 per cent. of the value of those metals contained in the ores is lost in the treatment.

MIMBRES CONSOLIDATED MINING COMPANY.—High water has interfered materially with work at this company's mill below Georgetown, and the company's production of silver for this year will be affected by the enforced shut down. The mill was idle for some time last spring while repairs were being made, and owing to an error in the shipment of some machinery which was sent to White Oaks instead of to Georgetown the mill was not started as soon as was expected. It is reported that rich ore has been found recently in one of the mines.

OHIO.

BELMONT COUNTY.

PITTSBURG AND WHEELING COAL COMPANY.—All the mines of this company, both at Bridgeport and at Maynard, under the general supervision of Mr. J. E. Watters, are in full operation, running steadily. The company has just completed a rope haulage plant at the Wheeling Creek mines, which is working nicely, largely increasing the daily output, and making a demand for more miners. The prospects appear to be quite fair for a good fall and winter's work at all

the mines. Since the introduction of the wire rope haulage these mines are run on full time. The Columbus scale and two-weeks cash pays are the terms on which these works are operated.

OREGON.

MARION COUNTY.

A large supply of red oxide of iron, it is said, has been located in this county on the line of the Oregon & Pacific Railroad.

PENNSYLVANIA.

COAL.

The strike of 2,500 miners in the Irwin mining region continues. It is said that coal operators have expended thousands of dollars in futile efforts to break the strike, but the miners from one end of the region to the other are still out. The companies have imported new men to operate their works. The new men have all left, as it requires experienced miners to mine the coal in that region.

The A. C. Cochran Coke Company has sold its Buckeye and Star plants, consisting of 160 ovens and one shaft, to the McClure Coke Company for $175.000. It is stated that this makes the latter company the second largest in the coke regions.

A telegram from Scottdale says that the Knights of Labor and the National Progressive Union of the coke regions have united, and the organization will hereafter be known as District No. 4 of the United Mine Workers. It is stated that the coalition of the two bodies makes an organization of 20,000 members. They will be governed by one set of division officers. The amalgamation is the result of a conference held at Scottdale on the 24th inst. The workingmen are getting their forces together, as they entertain fears of opposition from the operators next February, when they present their annual demands. In the event of opposition they intend to inaugurate a strike. They want weigh scales placed on tipples and eight hours work per day.

OIL.

Exports of refined, crude, and naphtha from the following ports, from January 1st to September 19th, were as follows:

	1890. Gals.	1889. Gals.
From Boston	2,044,732	3,336,469
Philadelphia	112,788,660	107,053,721
Baltimore	9,176,360	5,748,611
Perth Amboy	10,773,329	12,983,385
New York	308,660,877	323,128,83
Total	443,443,958	452,251,020

SOUTH DAKOTA.

LAWRENCE COUNTY.

BLACK HILLS ASBESTOS MINING COMPANY.—This corporation, which was lately organized on a group of six mines located on Whitewood Gulch, about seven miles south of Deadwood, has contracted with eastern parties to ship them 25 tons of asbestos on completion of the B. & M. R. R., whose track passes directly over the property of the company.

HAWKEYE GOLD MINING COMPANY.—This company was incorporated a short time ago, under the Iowa State laws. Mr. David Hunter, formerly superintendent and general manager of the Pluma Mining and Milling Company, was the prime mover in the new organization. The directors are Messrs. G. Banchbach, D. Secor, of Chicago; W. R. Ankeny, W. J. Ham, M. E. Bannister, of Des Moines, Ia., and David Hunter, of Deadwood. The capital stock consists of 250,000 shares, par value $10. It is said that sufficient money for necessary development work is now in the treasury.

TENNESSEE.

The Ducktown copper mines, in the Great Smoky mountains, perhaps the most ancient on the American continent, have in recent years been abandoned. The want of fuel starved out the modern miner. The problem of cheap fuel has now been solved and a railroad penetrates the old Tennesseean hills. The mines are to be transferred to an English syndicate. The principal mines are owned by the Union Consolidated Company, and during the 13 years the company was in operation they produced 5,000,000 pounds of copper, netting $1,500,000.

TEXAS.

A press dispatch from Waco says: Chase Longcope, of Philadelphia, Pa., and L. F. McClure, of Columbus, O., are in Waco as representatives of a syndicate of Ohio and Pennsylvania people, which has purchased a large area of territory in Llano and Mason counties. The lands are rich in iron, lead, copper, coal, silver and gold, and it is the best mineral land in the State. At present there is no railroad to it, and the object of the visit is to secure the co-operation of Waco people in the construction of a railway from this point to Llano, through Gatesville and Lampasas. It will be called the Texas Iron route.

UTAH.

SUMMIT COUNTY.

MONTREAL MINING COMPANY.—Some attention is attracted by the new strike in this company's ground, which is situated in the lower part of Snake Creek district. An incline was sunk this summer, and recently at a depth of about 90 eet a three foot vein, nearly all ore, was discovered. Drifts have been run in both directions on the vein for about 20 feet and the results are very encouraging. Assays of the average yielded 87 ounces silver, over 60 per cent. lead and a few dollars in gold to the ton. Developments will be pushed as rapidly as possible. It is proposed by the management to continue the lower tunnel a couple of hundred feet in order to get greater depth on the vein, which lies between quartzite and line walls. The developments at the mine are conducted under the direction of Mr. C. A. Springer.

(From an Occasional Correspondent.)

In July of this year the rotary dryer and the Stetefeldt furnaces at the Marsar mill, Park City, Utah, were reconstructed by C. A. Stetefeldt for burning producer gas, made in a Taylor producer from Rock Spring nut coal in place of wood. The change has resulted in saving about $50 per day in the cost of fuel and labor, in drying and roasting from 65 to 70 tons of Daly ore. At the same time the chlorinations of the ore, after roasting in the Stetefeldt furnace, have improved about two per cent.

Considering that wood is becoming dearer and more scarce every year in Western mining camps, the introduction of gas-fuel is of great importance. The new plant has worked smoothly, and without interruption since the end of July, and the Taylor gas-producer gives great satisfaction.

VERMONT.

ORANGE COUNTY.

(From our Special Correspondent.)

COPPERFIELD, Sept. 18.

COPPERFIELD MINING AND SMELTING COMPANY.—Reports from the mine state that the main shaft has been sunk 42 feet, following the main vein, which varies from five to eight feet in width of solid ore. A heavy pillar 10 × 12 feet was left on the north side of the track. In order to open up the stopes it was necessary to drift around it from both sides. This gives stoping ground 55 feet, with a vein varying from 6 to 18 feet high.

The vein in the bottom is still improving. The oldest and most reliable local miners say that never before was so rich an ore body found in this mine. The output for several days past has been over 50 tons per day, and the ore dressed assayed nearly 14 per cent. higher than it has ever before gone to the roaster.

Three furnaces have been in full blast for over one month, day and night, and the outlook here is most promising.

WEST VIRGINIA.

A bed of coal eight feet thick has been found in Pendleton county, and according to reports can be traced on through into Grant county. It is a valuable find, and it is said that the West Virginia Central Railroad will be extended to it.

SCOTCH COAL, IRON AND RAILROAD COMPANY.—This company, recently organized, will build a railroad from Charleston through the company's land in Wyoming and McDowell counties, to connect with the Norfolk and Western Railroad. John A. McDonald, Ottawa, Canada; Alexander McBean, of Glasgow, Scotland; Charles H. Wright, James E. Coleman and Henry Reed, of New York; Benjamin F. Howland, of St. Andrews, Fla., and others, are interested. The main office will be in Charleston.

FAYETTE COUNTY.

ROYAL COAL AND COKE COMPANY.—This company has decided to further improve its mines at Prince, on Elk River, and it is asserted that an electric mining plant will be put in.

WEST FAIRMOUNT COAL AND COKE COMPANY.—Capt. J. E. Watson, who purchased the West Fairmount mines a few months ago, which were badly flooded, has organized the above company which will be ready to begin operations in a short time. Workmen are engaged in making repairs and extensions of the coke making plant, which will be the chief feature of the concern.

MASON COUNTY.

New mining machinery has been ordered for several of the mines to take the place of some old-style machinery that has been there for a number of years. The new machinery is all to be run by electricity.

FOREIGN MINING NEWS.

AUSTRIA.

Two thousand miners at Troppau, Austrian Silesia, went on strike on the 23d inst. The movement is extending to the frontier district of Moravia and Austrian Silesia. The strikers made many riotous demonstrations, and in a number of cases have been guilty of plundering shops and intimidating workmen. A cable dispatch from Vienna, dated September 24th, states that the miners on strike number 5,000. Troops have taken possession of the mines. The soldiers have made several charges on disorderly crowds and many arrests have been made.

BRITISH COLUMBIA.

WEST KOOTANIE DIVISION—HOT SPRINGS DISTRICT.

(From our Special Correspondent.)

NELSON, Sept. 11.

A. D. Wheeler, one of the owners of the Skyline, Krao, and other mines of this district, recently purchased the 244 claim for $1,500. Henry Anderson, the recorder of the Hot Springs camp, has sold his interests south of the Skyline claim for $3,000, and another claim of minor importance for $500.

AYESHA.—The survey of this claim has been completed, and an application has been made for a crown grant of the property.

NEOSHO.—An important discovery of high-grade silver ore has also been made on this claim, about 150 feet south of the former workings. The Neosho was mentioned in a recent number of the ENGINEERING AND MINING JOURNAL as one of the most promising claims in the camp.

TIGER.—It is reported that this claim has been sold for $19,000 to Chicago parties, but—the transfer having been made at Spokane Falls—reliable information is not yet to hand. The claim lies on the edge of the wide valley of Cedar Creek, and is well worthy of attention. The vein is about 3 feet wide, runs N. 67° W., dips at an angle of 60 degrees, is considerably decomposed near surface, and occurs between fine-grained gray micaceous schist and limestone. The ore consists of coarse crystalline galena, with a little copper and iron pyrites.

UNITED.—Considerable excitement was caused last week by the discovery on the United claim, at a depth of 22 feet, of an 18-inch body of high-grade ore. Native silver (wire) is present in abundance, and assays have been obtained running over $13,000 per ton. The United is the claim recently purchased by the Revelstoke Mining Company for $7,500. The remainder of the ledge—total width about 8 feet—carries low-grade galena. Some 800 tons of the latter class of ore is now on the dump, the result of four weeks' work.

ILLECILLEWAIT DISTRICT.

MAPLE LEAF.—Good quality ore is being taken out of this mine, which is an extension of the Lanark. Two car-loads of ore are lying on the dump and this is being packed down for shipment to the smelter at Revelstoke. It is not yet known whether the smelter will be run this winter.

SELKIRK MINING AND SMELTING COMPANY.—More men are being put on at the Lanark mine and winter supplies are being got in. The tunnel, to tap the vein at a considerable depth, is now in 350 feet and after running 40 feet further connection will be made with the upper tunnel, which will mean a raise of about 300 feet. The company is also doing assessment work on five other claims.

NELSON DISTRICT.

EAGLE CREEK GOLD MINING COMPANY.—This company is working unobtrusively but is doing much to show up the merits of the district. The last clean-up was very satisfactory, but the company naturally prefer to keep the dates and amounts of their bullion shipments a secret, for there is at present no express company in the country willing to undertake the transportation of such material. The amount of water in Eagle Creek has hardly been sufficient of late to keep the mill running to its full capacity, but the rainy weather, now setting in, will soon remove all cause for alarm on that account.

GOAT RIVER.—Some 25 men are at work in this camp, on the east side of the Kootanie River and about 12 miles from the boundary line. The ledges, of galena ore, vary from two to six feet in width. Recent assays run 58·8 ounces in silver and 58·71 per cent. lead per ton.

KOOTANIE BONANZA MINING COMPANY.—Some 2,000 ore sacks have been ordered by this company, which means that a shipment of the ore taken out of the Silver King mine last winter will be made as soon as possible. This is probably one of the results of the recent death of R. D. Atkins, who was responsible for the money payments of the company and who intended to ship no ore this year.

TRAIL CREEK.—Between 75 and 100 men are now in this camp and the number of recorded claims is close upon 100. Many of these are apparently of considerable importance. D. C. Corbin, of the Spokane-Northern Railroad evidently has his eye upon the new camp, for his representative has made several substantial offers for claims that took his fancy. A sample test of 600 pounds of ore from the Josie claim carried $60 per ton in gold, a few ounces in silver, and 8⅛ per cent. copper.

CANADA.

NOVA SCOTIA.

(From our Special Correspondent.)

COXHEATH COPPER MINES.—Developments continue to be satisfactory to the management. The 260-foot cross-cut north from No. 2 shaft has cut vein "B" at 87 to 103 feet from the shaft, showing the width of the vein at this level to be 16 feet; it contains eight feet of good ore next to the hanging wall, the remainder being partly of lower grade, with streaks of rich ore. One of these streaks lying on the foot wall is 15 inches wide. The average of the vein is fully as high as at the 184-foot level, where it was estimated to be 10 per cent. copper. The hanging wall is dipping to the north and the foot wall to the south, indicating a further increase in width with depth. Shaft No. 1 is unwatered down to the 60-foot level. From this depth the old cross-cut south into the moun-

tain is already in 70 feet, and will be at once continued to intercept known veins discovered since work at this shaft was suspended.

At the new vein on the mountain the shaft is down 25 feet, the bottom being all in ore; this shaft will hereafter be known as No. 3 shaft. Tunnel between No. 1 and No. 2 shafts is in 130 feet. An additional force of 15 workmen are now crosstining the surface opposite the lake, 2,000 feet west of No. 2 shaft. Eight Rand power drills are now constantly at work on the property, and the other two will be started at an early day. Since the reports on the mine, rendered last July, over 6,000 tons of additional ore have been put in sight on vein "B" alone.

GERMANY.

A gigantic coal syndicate, representing not less than a production of 11,000,000 tons, has been formed. Its principal object is to check the rise in wages, which employers state have increased nearly 50 per cent.

PRUSSIA.

Statistics of the main products of the mining and kindred industries in Prussia were, according to *Zts. f. d. Berg- Huentten-v. Salineuw*, as follows:

	1888. Tons.	1889. Tons.
Pig iron	3,099,000	3,219,000
Zinc	133,280	136,009
Lead	89,800	90,800
Litharge	3,200	2,370
Copper	18,900	21,700
Sulphuric acid	298,200	321,100
Nickel	288	282
Sulphate of copper	1,620	1,700
Silver	259,500 kg.	256,300 kg.
Gold	196 "	179 "

SOUTH AMERICA.

ECUADOR.

A correspondent to the Panama *Star and Herald* writes as follows from Zaruma: "The Portobelo mine, which is owned by an English company, is at work on the 20 stamps, which are returning an ounce of gold for every ton of quartz crushed. The lode is 18 to 20 feet in width, and many old workings are fallen in with. It is believed the main lode, when reached, and which has never yet been touched, will yield considerably. During July 500 ounces of gold were shipped."

Señor Julio F. Galvez, of the Lucia Mining School, accompanied by a party of experts, has examined a number of mines, and reported on the lodes in the Zancudo and the Cristina. Subsequently he will visit some other lodes, as also the alluvial gold fields situated on the Calera, Amarillo and Yaguadu rivers.

PERU.

An English company, with a capital stock of £300,000, according to the Panama *Star and Herald*, has purchased the petroleum deposits situated at Talovia, near Payta, where large factories are already working, producing a good quality of oil.

In mining great progress is manifested. The steamers from the North are crowded with investors and engineers from the United States, who seek to convince themselves of the auriferous wealth of Peru.

Another English corporation under the guidance of Mr. George Petrie has rented from the government the Cinnabar mines of Santa Barbara, near Ayacucho, which, for nearly half a century, have been idle from natural impediments. These obstacles, caused by earthquakes, are to be removed, and the mines largely worked.

SWEDEN.

The apatite discoveries in Northern Sweden, especially in the Gellivara district, have of late been examined and reported upon by a special committee. The members of this committee do not agree on all points. One of the experts holds that the apatite is in general so closely combined with magnetic iron ore that it will be necessary to grind the ore and separate the iron magnetically. The largest deposits of iron ore and apatite contain from a few per cent. up to 10 or 11 per cent. of the latter; there is, however, also an ore in considerable abundance which contains 19 per cent. of apatite, and, finally, one which contains as much as 60 per cent. of apatite, but as to the extent of which no definite information has as yet been obtained. Another member of the committee is of the opinion that the apatite itself is sufficient to make the breaking and further handling remunerative. The residue can be further subjected to either a crushing and separation, or smelting down with lime or quartz for the purpose of obtaining Thomas slag and phosphoric iron for the basic Martin process.

MEETINGS.

Breece Mining Company, No. 115 Broadway, New York, October 1st, at 2 P. M.

Colorado Oil Company, at No. 155 Stewart Building, New York City, October 6th, at 12 o'clock, noon.

Eureka Consolidated Mining Company, No. 306 Pine street, New York, October 20th, 11:30 a. m.

Gem Mining Company, at Room 39, Merchants' Exchange, San Francisco, Cal., October 1, at 12 o'clock noon.

Golden Fleece Gravel Mining Company, at Room 310, Phelan Building, San Francisco, Cal., September 30, at 8 P. M.

Presido Mining Company, at Room 39, Nevada Block, 309 Montgomery street, San Francisco, Cal., October 6, at 12 o'clock noon.

DIVIDENDS.

Eureka Consolidated Mining Company, dividend No. 88 of 25 cents per share, $12,500 payable Oct. 8, at the office of Laidlaw & Co., 14 Wall street, New York. Transfer books close September 29 and reopen October 9.

Minas Prietas Mining Company, dividend No. 6 of 50 cents per share, payable September 27, at No. 18 Wall street, New York. Transfer books close September 22 and reopen September 29.

Minnesota Iron Company, dividend of one and one-half (1½) per cent., payable October 1st, at the office of the company, Mills Building, New York City.

ASSESSMENTS.

COMPANY.	No.	When levied.	D'l'nq't in office.	Day of Sale.	Amn't per share.
Alpha, Nev	5	Sept. 16	Oct. 22	Nov. 11	.25
Alt , Nev	39	Sept. 1	Oct. 7	Oct. 29	.50
Best & Belcher, Nev	47	Aug. 21	Sept. 25	Oct. 17	.25
Goleta, Cal	1	Sept. 16	Oct. 27	Nov. 24	.10
Gould & Curry, Nev	65	Sept. 16	Oct. 21	Nov. 13	.30
Humboldt, Nev	1	Aug. 16	Sept. 29	Oct. 25	.01
Kentuck	22	Aug. 18	Sept. 22	Oct. 14	.30
Leigh Gravel, Cal	1	Sept. 3	Oct. 13	Nov. 5	.25
Live Oak D. Gravel, Cal	12	Sept. 3	Oct. 9	Oct. 31	.05
Locomotive	8	Aug. 13	Sept. 18	Oct. 7	.05
Mayflower, Gravel, Cal	48	Aug. 4	Sept. 6	Sept. 29	.20
Occidental	7	Aug. 5	Sept. 11	Oct. 7	.25
Peer	9	Aug. 7	Sept. 12	Oct. 3	.10
Peerless	15	Aug. 14	Sept. 23	Oct. 14	.15
Teresa, Mex	2	Aug. 13	Sept. 18	Oct. 8	.05
Utah Con	10	Aug. 5	Sept. 15	Oct.	.25
Weldon, Nev	3	Sept. 3	Oct. 9	Oct. 30	.10

MINING STOCKS.

For complete quotations of shares listed in New York, Boston, San Francisco, Baltimore, Denver, Kansas City, Minneapolis, St. Louis, Pittsburg, Birmingham, Ala.; London and Paris, see pages 379 and 380

NEW YORK, Friday Evening, Sept. 26.

After a few weeks of semi-activity the market for mining shares has settled down to its former dullness. Its spasmodic spurt has dwindled to slack business. The week under review offers no features of interest, or, indeed, any features at all. Prices, however, with but few exceptions, have held their own fairly well, but the volume of business has not been very great. There seems to be a dearth of leaders in the mining market. Dealers all appear to think that higher prices will rule ere long, and yet, not a man can be found who is willing to take the initiative. The present dull spell at the Mining Exchange can only be accounted for by the fact that people will not trade, and why they won't is a question which many a dealer in mining stocks has asked himself without being able to solve the problem.

A somewhat odd occurrence this week is that according to the official lists of sales at the Consolidated Stock and Petroleum Exchange a greater number of dividend-paying shares was sold than of non-dividend shares—viz,, 34 421 dividend and 34,400 non-dividend-paying shares, with a total 68,881 sold. It generally happens that non-dividend stocks are the favorites, chiefly because of their lower prices. The exception this week alluded to above is significant, if it means that the public is beginning to look upon legitimate mining enterprises as a good field for investment. It may also mean that it has little confidence in mining stocks for speculative purposes. This is as it should be.

We note sales of the Black Hills stocks, Caledonia was quiet at $1.75@$1.85. Homestake was in moderate demand at $10.75@$11.75. Iron Hill, which has not been traded in for some time shows a solitary sale at 55 cents and Sullivan Consolidated another at 99c. Among Utah properties Horn Silver shows sales of 1,605 shares at from $3.37@$3.65; Ontario opened at $45.50, advanced to $47.25, and declined to its opening price, with sales of 300 shares, and Stormont had one transaction at 7c.

Moulton, for some months a stranger to the Exchange, was traded in this week at 60c. Other Montana stocks were not touched.

Of the California stocks, 2,000 shares of Astoria were sold at 5c. and 6c. Sutter Creek declined from $1.40 to $1.30. Bodie Consolidated was rather neglected at $1.50@$1.75, which, however, is a pretty good advance. Mono had a single sale at 75c.; Plymouth closed lower than it has for some time, having sold at $3@$3.25; Standard had one sale at $1.50. Reference to this property will be found in our mining news column. Brunswick Codsolidated was on the decline this week, opening at 13c. and closing at 7c., the reported sales aggregating 11,000 shares.

So far as number and variety of shares sold this week, Colorado has done well. American Flag, which had not been traded in for a long time, had one sale at 5c., Crescent another at 17c., and Denver one at 10c. Lacrosse was steady and in some demand at 8c., Catalpa was quiet at 40c., and Chrysolite at 35c. Freeland shows sales aggregating 3,400 shares at 36c.@37c. Leadville Consolidated shows the largest transaction in point of numbers, 21,700 shares having been disposed of at 15c. @16c.; Little Chief was quiet at 42c.

Silver King was neglected at 20c. Silver Mining of Lake Valley was stationary at 82c.; Mutual Smelting and Mining Company was moderately traded in at $1.40@$1.45; Rappahannock was steady at 6c.@7c.; Phœnix of Arizona declined from $1.10 to 95c., but continued one of the favorite stocks. San Sebastian was quiet at 47c.@48c. El Cristo was in better demand. Sales aggregated 1,500 shares, and the price advanced from 75c.@85c.

Of the Tuscarora stocks North Belle Isle had one sale at $1.10. Nevada Queen was steady at $1. In our mining news column will be found news which will interest stockholders and other people concerned in the Tuscaroras.

Of the Comstocks, Alta was steady at $1.25@$1.30; Barcelona had one sale at 11c; Best & Belcher was in moderate demand at $3.75@$3.85; Chollar was slightly higher than last week at $3.40@$3.55; Comstock Tunnel Bonds were traded in at 25c; Julia was in fair demand at 40@45c., with sales aggregating 1,500 shares; Kingston & Pembroke was stationary at 50c; Mexican was slightly higher than last week at $3.25@$3.60; Occidental was quiet at $2.10@$2.25; Potosi opened at $7.88 but declined to $7.13; Utah was steady at $1.25@$1.30. Consolidated California and Virginia at $4.75@$4.85 was neglected; Crown Point was sold at $3@$3.10; Gould & Curry was rather quiet at $2.25@$2.45; Hale & Norcross shows a solitary sale at $2.50; Ophir advanced during the week from $5@$5.38 and Savage from $3.75@$3.85; Sierra Nevada nad one transaction at $3, and Yellow Jacket was traded in to the extent of 400 shares at $3.50@$3.65.

Boston. Sept. 25.

(From Our Special Correspondent.)

There has been a fairly good trade in copper stocks the past week, but prices have declined to some extent, and the market does not look so encouraging for an advance as it did a week ago. The money question is no longer the factor which influences prices, but there seems to be a desire on the part of the public to sell rather than purchase, and under these conditions lower prices must prevail. The ingot copper position is unchanged, and with copper firm at 17c. and the demand quite equal to the supply, it would seem as if all good stocks purchased at present prices must in the long run pay a good profit to the holders.

Allouez came out rather more freely this week, and the selling is said to be by parties who were creditors of the banking house which suspended last week. However, that may be, the supply seemed to be large and price declined from 8¾@7¼, with later sales at $8. The burned shaft has been replaced and work fully resumed.

Atlantic declined from $25@$23¼ on rather moderate sales.

Boston & Montana was quite strong early in the week at $59½, but closed rather heavy at $57¾.

Butte has been quite active, opening at $20½ and declining to $19. Late reports from this property are of a very flattering character.

Calumet & Hecla sold at $310, and later at $305, dealings light.

Centennial sold at $29, declined to $26 on fair transactions. There has been more or less gossip regarding the mine. The latest dispatch received to-day from Capt. Vivian says: "Centennial outlook is very good indeed. I am better pleased with it than ever before."

Franklin has had a weakening tendency all the week, declining to-day to $21½. The Pewabic sale is to take place Nov. 6, and gossip has it that the Franklin is going to bid as high as $800,000 for it. This is said to be the cause of the decline in the stock, but it is not likely that the managers of the Franklin would give public notice of what they intend doing, and the story is doubtless made out of whole cloth to influence the market value of the stock.

The Kearsarge mine is said to be looking better than at any time for over a year. Stock sold this week at $18¼, but to-day was in demand at $19¼.

Osceola has ruled higher this week, selling up to $46¼, but declined to $45 in later dealings.

Quincy quiet at $125 and Tamarack steady at $204@$206.

Huron declined to $5⅝, National to $2 and Santa Fe to 60c. Central declined $1 to $24 for 50 shares. Ridge sold at $1, Star at 40c., Bonanza at 65c., Arnold at $1½, and a small lot of Pewabic was taken at $14.

The silver stocks were more active and lower. Catalpa declined to 35c.; Crescent to 12c. Dunkin was slightly firmer at 60c., and Breece sold at 45c.

3 P. M.—Osceola advanced this afternoon to $45½, and the same was bid at close, $46 asked. Kearsarge was off ¾; sales at $18¾, and Franklin firm at $21¾ bid.

By Telegraph.—Allouez, $7¼; Boston & Montana, $57¾; Butte & Boston, $19; Calumet & Hecla, $305; Centennial, $25 bid; Kearsarge, $18½ bid; Osceola, $45¼; Quincy, $125; Tamarack, $204 bid.

Lake Superior Iron and Gold Stocks.

(Special Report by David M. Ford, Houghton, Mich.)

IRON MINING STOCKS.

Name of company.	Par value.	Bid.	Asked.
Ashland Iron Co.	$25 00	$55.00	$60.00
Aurora Iron Co.	25 00	7.50	8.50
Champion Iron Co.	25 00	115 00	125.00
Chandler Iron Co.	25.00	41.00	43.00
Chicago & Minn. Ore Co.	100.00	116.00	120 00
Cleveland Iron Co.	25.00	16.50	17.50
Germania	25.00	11.50	12.00
Jackson Iron Co.	25 00	110.00	125.00
Lake Superior Iron Co.	25 00	68.00	72.00
Milwaukee Iron Co.	25.00	5.50	6.50
Minnesota Iron Co.	100.00	86.00	89.00
Montreal Iron Co.	25.00	9.00	10.00
Norrie (Metropolitan)	25.00	73.00	75.00
Odanah Iron Co	25.00	20.00	22 00
Pittsburg Lake Angeline Co.	25.00	175.00	185.00
Republic Iron Co.	25.00	41.50	42.50

GOLD MINING STOCKS.

Name of Company.	Par value.	Lowest.	High.
Gold Lake Mg. Co.	....	....	....
Grayling Gold & Silver Co.	$25.00	....	....
Michigan Gold Co.	25.00	*$1.35	....
Peninsula Gold & Silver Co.	25.00	....	.50
Ropes Gold & Silver Co.	25.00	1.75	$2.00

* Assessment paid.

St. Louis.

Sept. 24.

(From our Special Correspondent.)

Prices and sales for the week ending Wednesday, Sept. 24,1890.

Company.	Opening.	H.	L.	Closing.	Sales.
Adams	$2 15	2.17½	....	1.85	850
American & Nettie	1.07½	1.17½	....	1.15	900
Central Silver	.17½	....	....	.16¼	2,300
Cleveland-Colo.	.04½	....	....	.04½	100
Cleveland-Idaho	.08	....	....	.07½	
Gold King	.04	....	.03½	.04½	1,166
Granite Mountain	45.50	....	....	45.00	15
I. X. L.	.02½	....	....	.01½	800
La Union	.09½	....	....	.08½	13,300
Little Albert	.32½	.35	.30	.33¾	1,200
Mickey Breen	1.75	1.77½	1 52½	1.60	8,800
Max. Imp.	.10	.13	....	.10	
Montrose Placer	.65	.66¼	....	.60	700
Mountain Key	.51¼	.55	....	.50	
Pat Murphy	.14½	.15	....	.14¼	1,800
Richmond Hill	....	....	....	....	
Small Hopes	.90	.92½	....	.90	
Silver Age	1.67½	....	....	2.07½	300
Tourtelotte	.04	....	....	.03	500
Yuma	.57½	.58¾	....	.45	800
Total					33,62c

Kansas City.

Sept. 22.

Company.	Opening.	H.	L.	Closing.	Sales.
Argonaut	14†	14†	14†	14	....
Bates-Hunter	43½	43½	43	43	3 500
Big Six	9*	9*	9*	9*	200
Brownlow	....	....	....	....	....
Cash Gold	14*	14*	14*	14*	4,000
Clay County	70	77*	70	....	400
Diamond B	3†	3†	2½§†	2½§	....
Hard Money	5†	5†	5†	5†	....
Hunki Dori	13½‖	13½‖	10†	10	100
Iron Clad	16†	16†	16†	16	....
Kansas City M. & M. Co.	2.60	2.60	2.60	2 60	180
Kansas City, Col	10†	13*	10†	10½	500
King Jack	....	....	....	....	....
Leavenworth	5‡	5‡†	5‡†	5‡	....
Little Nugget	1.09‖	1.10‖	1.04	1.04	2,400
Little Rule	63	66	66	66	200
May Mazeppa	75	75½	75	75	300
Minnequa Zinc M. Co.	17*	17*	16	16	200
Monte Cristo	3½	5*	3½	3¾	400
Morning Glim	39	39	36½	30	2,000
Pay Rock	5†	5†	5†	5	....
Pelican	30‡	....	....	....	....
Potosi	8†	....	....	5	....
Running Lode	17	17	17	17	200
Sylph	16†	16†	15	15	....
Total					14,580
Pit sales					....

†Bid. ‡ Asked. * Buyer 30. § Seller 30. §* Seller 60. ‖Buyer 60.

Denver.

Sept. 22.

(From our Special Correspondent.)

The market has shown a more healthy tone for past week, although orders for stocks and sales have not proven as good as anticipated. Indications are that there will be a weeding out of some of the useless listed properties that will prove beneficial both at home and abroad. It is to be hoped that a proper method will be adopted to bring before capitalists the merits of the paying mines, so that other than home money will be invested in developing work. They must go away from home to do this, and the sooner brokers fully understand it the sooner will their hopes be realized. Quite a ripple of excitement was created on Saturday by the sale of a number of certificates of membership at the $500 rate to some twenty of our prominent business men, principally owners of property in the immediate vicinity of the new exchange building. This, it is thought, will add considerably to the standing of the exchange. Information from the principal camps show a continued increase in development work and gross tonnage. Good miners still in demand.

The board of directors are determined that the owners or lessees of listed mines shall make monthly reports of the work being done and the financial condition of the mine. A resolution has been passed that hereafter before a mine is listed the company shall deposit with the secretary of the exchange 1,000 shares of the stock as a guarantee that the monthly report will be promptly made. Should the company fail to make a report for two successive months the stock will be declared forfeited, and will be sold to the highest bidder, the proceeds to go into the treasury. The company will then be required to deposit another 1,000 shares, and, failing, the stock will be stricken from the list. The directors are going to boss or quit business.

Prices and sales for the week ending Sept. 20th:

Company.	Opening.	H.	L.	Closing.	S.
Alleghany, Colo.	12½b	†15	12¾	12¾	1,200
Amity, Colo.	04½b	*05	04	03¾	1,500
Bangkok, C. B., Colo.	09½	*09½	08	09	20,800
Bates-Hunter, Colo	48	49	48	45	1,500
Brownlow, Colo.	08½b	08½b	08b	08	....
Calliope, Colo.	32b	34	34	30	500
Cash, Colo.	20a	11	11	11	100
Clay County, Colo.	39¾b	40	71b	71	4,700
Hard Money, Colo.	04b	04½b	04	03½	200
Leavenworth	....	54	50	54	29,900
Little Rule, Colo.	67b	68	68	68	3,100
Matchless, Colo.	100b	200b	100b	150	....
May-Mazeppa, Colo.	78	82	78	81	9,500
Mollie Gibson, Colo.	30b	50b	30b	....	....
Oro, Colo.	....	250b	100b	100	....
Pay Rock, Colo.	*05½	†06¼	05	05	37,300
Puzzler, Colo	10½b	11¼b	10½	11¼	5,600
Reed-National, Colo.	70b	71	70	70	1,300
Running Lode	16½b	17	16¾	16½	300
Silver Cord, Colo.	30b	30b	30b	30	....
Whale, Colo	23½b	*24	23	22½	700
Prospects:					
Argonaut, Colo.	28	28½	28	..	2,400
Aspen United, Colo.	05b	05	05	05	1,400
Big Indian, Colo.	10¼b	10¾	10	10	600
Big Six, Colo.	06¾b	07¼	07	06¾	3,200
Century, Colo.	....	20b	20b	20	....
Claudia J. Colo.	08¼b	09¼	08¾	08½	5,100
Nat. G. & Oil Co.	*16½	*18	14½	15½	4,700
Diamond B., Colo.	04	04	02½	03¼	9,500
Emmons, Colo.	*27	*30b	24	25½	4,400
Golden Treasure, Colo.	15b	15¼	15	14	500
Ironclad, Colo.	17b	*19	17	17	4,200
John Jay, Colo	10b	*17	15	16	1,000
Justice	12b	12	12	11¼	400
Legal Tender, Colo	03¼b	03½b	03¼	03¼	6 00
Morning Glim, Colo.	30b	42	*35	29	1,900
Park Consolidated	18½b	20½	20	20	700
Potosi, Colo.	09b	09	08	08	5,600
Rialto, Colo.	50b	54b	50	54	100
Total for the week					164,500

*Buyer 30 days. †Buyer 60 days. ‡Seller 60 days. §Seller 30 days. a Asked. b Bid.

Salt Lake City.

Sept. 20.

Company.	Opening.	High-est.	Low-est.	Closing.	Sales.
Alice, Mont.	2 50 b	2 55 b	2.50 b	2.55 b	....
Alliance, Utah	2.40 b	2.55 b	2.40 b	2.55 b	1000
Anchor, Utah.	5 50 b	5.75 b	5.50 b	5.75 b	100
Apex, Utah.	.16 b	.17 b	.16 b	.17 b	500
Barnes, Utah	.04 b	.10 b	.04 b	.10 b	20100
Cent.-Eureka, Ut.	29.50 b	29.75 b	29.50 b	29.75 b	50
Congo	....	....	....	....	....
Crescent, Utah	.24 b	.25 b	.24 b	.25 b	2500
Daly, Utah	23.50 b	23.60 b	23.50 b	23.60 b	100
Glencoe, Utah	1.00 a	1.00 a	1.00 a	1.00 a	....
Horn Silver, Utah	3.50 b	3.50 a	3.50 b	3.50 b	....
Malad Con., Id.	.05 a	.05 a	.03 b	.03 a	....
Mammoth, Utah.	3.50 b	4.00 a	3.50 b	3.70 b	....
Nabob	....	....	....	....	....
Northern Spy	1.50 a	1.50 a	1.40 a	1.40 a	....
Ontario, Utah	....	....	....	....	....
Stanley	....	....	....	....	....
Utah L. & C. Co.	8.10 b	8.35 b	8.10 b	8.35 b	100
Utah & Mont.	....	....	....	....	....
Utah Oil Co., Utah	.20 a	.20 a	.20 a	.20 a	....
Woodside, Utah	.80 b	.80 b	.80 b	.80 b	....
Total					24,450

*Buyer, 30 days. †Seller, 30 days. ‡Assessment paid. a Asked, b bid.

PIPE LINE CERTIFICATES.

(Specially reported by Messrs. WATSON & GIBSON.)

The petroleum market this week has been lower, especially in Ohio oil. The cause of the break is not palpable, but as speculation has run down to a very low ebb in it, it is possible that realizations by weary holders may account for the break. There is no use to predict when a revival of interest in petroleum speculation will take place, but it is safe to say that it could easily be accomplished when general speculative conditions become more favorable, if the leading power in the oil trade should apply itself to the task of making oil again a popular speculation.

We think Ohio oil is very low on its merits, either for fuel or illuminating purposes, and although it is very slow in the market we should favor purchases of it upon a further decline.

NEW YORK STOCK EXCHANGE.

	Opening.	Highest.	Lowest.	Closing.	Sales.
Sept. 20	81	81	80¾	80¾	7,000
22	80⅞	81	80	80	40,000
23	80	80	79¼	79¼	27,000
24	79½	80	79½	80	31,000
25	80	80¼	80	80	15,000
26	80	80	80	80	5,000
Total sales in barrels					125,000

CONSOLIDATED STOCK AND PETROLEUM EXCHANGE.

	Opening.	Highest.	Lowest.	Closing.	Sales.
Sept. 20	81⅝	83⅝	81½	81½	7,000
22	81¾	81¾	80	80½	78,000
23	80	80½	78⅞	80	49,000
24	80	80	79¾	79⅞	22, 00
25	79¾	80	79¾	79¾	17,000
26	80	80	79½	79½	13,000
Total sales in barrels					186,000

BUCKEYE PIPE LINE CERTIFICATES.

NEW YORK STOCK EXCHANGE.

	Opening.	Highest.	Lowest.	Closing.	Sales.
Sept. 20	33⅝	33⅝	33⅜	33⅜	5,000
22	33¾	33¾	33⅛	33½	17,000
23	33	33	33	33	12,000
24	31½	31½	31½	31½	5,000
25	29¾	29¾	29¾	29¾	5,000
26	....	....	....	....	....
Total sales in barrels					44,000

CONSOLIDATED STOCK AND PETROLEUM EXCHANGE.

	Opening.	Highest.	Lowest.	Closing.	Sales.
Sept. 20	*	....	....	....	....
22	33⅞	33⅞	33⅜	33⅜	2,000
23	....	....	....	....	....
24	33¾	34¼	31⅝	32¼	21,000
25	31¼	31¾	29¾	29¾	12,000
26	28½	30	28½	30	13,000
Total sales in barrels					48,000

* No sales.

COAL TRADE REVIEW.

NEW YORK, Friday Evening, September 26.

Statistics.

Mr. John H. Jones, chief of the Bureau of Anthracite Coal Statistics, furnishes us the following statement of shipments of anthracite coal (approximated) for the week ending September 20th, 1890, compared with the same period last year:

Regions.	Sept. 20, 1890.	Sept. 21, 1889.	Difference.	
Wyoming Region. Tons	401,145	371,378	Inc.	29,767
Lehigh Region ... "	13',259	136,890	Dec.	5,631
Schuylkill Region. "	249,535	247,052	Inc.	2,483
Total	781,939	755,320	Inc.	26,619
Total for year to date	24,169,370	24,656,412	Dec.	487.042

PRODUCTION OF BITUMINOUS COAL for week ending Septemoer 20th and year from January 1st:

EASTERN AND NORTHERN SHIPMENTS.

	1890. Week.	1890. Year.	1889. Year.
Phila. & Erie R.R.	2,722	95,179	52 199
Cumberland, Md.	77,361	2,728,231	2,201,881
Barclay, Pa.	*2,997	109,250	81.418
Broad Top, Pa.	*11,124	363,220	232,915
Clearfield, Pa.	67,424	2,702,622	2,225.365
Allegheny, Pa.	18,951	930,885	569,083
Beach Creek, Pa.	*33,872	1,344,313	1,077,496
Pocahontas Flat Top.	34,776	1,367,371	1,223,602
Kanawha, W. Va.	42,973	1,471,948	1,303,555
Total	292,200	11,113,022	8,967,544

* Estimated.
‡ Week ending Sept 14.

WESTERN SHIPMENTS.

Pittsburg, Pa	11,472	585.755	453,879
Westmoreland, Pa	9 570	840,869	1,041,712
Monongahela, Pa.	16.114	366.986	289,476
Total	37.156	1,794,610	1,788,067
Grand Total	329,356	12,907,632	10,755,611

PRODUCTION OF COKE on line of Pennsylvania R. R. for the week ending September 20th, and year from January 1st, in tons of 2,000 lbs.: Week, 103,894 tons; year 3,819,804 tons; to corresponding date in 1889, 3,110,416.

Anthracite.

The past week has brought with it a decided movement all along the line. A much healthier feeling prevails in all quarters, and the action of the sales agents on the 25th inst. has put considerable backbone into the market. The advance of the season has caused an improvement in business, and should cold weather make its appearance, it is expected that the consumers will at last make an impression on the accumulated stocks in the coal yards. Retailers will be rewarded for laying in such large stocks at midsummer prices, since there have been two rises in the wholesale scale since then.

The sales agents reached an agreement to increase the October prices, 10 cents a ton on broken, 15 cents a ton on egg and stove, and 20 cents a ton on chestnut. The output agreed upon for October was 3,500,000 tons, which it is expected the market will take without causing any material increase in the volume of stocks.

The question which is now more or less agitating the minds of the largest operators in hard coal is that of labor. Anthracite miners are a scarce article in Pennsylvania, owing to two causes. One of these is the new law which requires that all miners, mine bosses and superintendents shall pass an examination before working in the mines. The other is that the restricted output left a large number of the miners idle or on short time last winter, and most of them drifted off to the soft coal regions, to a great extent supplying the places of the strikers in those localities. Numbers of them settled there and show no inclination to return as yet, which will be more effectual in restricting the output than any agreement would be.

Several operators inform us that many chambers in their mines are not being worked, because of the scarcity of labor. If an unusual demand for anthracite coal should be made through a very cold winter, equal to that of the largest months of former winters, there will undoubtedly ensue a shortage in the supply. It is questioned by those concerned whether under existing circumstances they could move a much larger tonnage from the mines than they are doing now.

The new scale, which goes into effect on October 1st, is: Stove, $4.30; egg, $4.05; chestnut, $3.95; broken, $3.75.

Pea and buckwheat have stiffened appreciably, and now sell at: pea, $2.25; free-burning, $2.60 to $2.75 on board. Buckwheat, Lehigh, $1.60; free-burning, $1.50@1.55 on board.

Bituminous.

Considerable activity has marked the past week, and coal is reported rather short, owing to a scarcity of cars. Many operators, some of them the largest in the soft coal trade, have been obliged to fill their contracts by borrowing and buying from other operators much more than at any other season. Orders for future delivery have been coming in much more freely than of late, and in some cases have been declined at present rates, and in others have have been declined for the present on any conditions.

An incendiary fire which destroyed the wheel house of the New Central Coal Company's mine, in the Maryland region, has shut off that supply for a week or two. There is, too, considerable uneasiness in the Clearfield region about possible developments in the labor troubles there. It was understood that the convention of operators and miners two weeks since settled all the points in dispute with the exception of the main one of the increase of ten per cent. in wages. But when it came to signing the agreement the Beech Creek operators and some of the miners declined to do so, and the miners of the Frugality district requested the company not to enforce the new scale, as the old scale suited them better. Nevertheless, the new scale will go into operation on October 1st, and the possibility of further disagreements causes a feeling of uneasiness in this market. "We are sailing as near shore as possible," said one large operator, "in case of a sudden blow, which doesn't appear unlikely in the near future." There is no doubt that the consumption of soft coal is increasing rapidly, and the present difficulty in meeting it, added to a possible stoppage of mining operations, results in a slight feeling of apprehension as to what may happen during the next week or two. Hence operators are, as a rule, seeking no outside business, contenting themselves with filling contracts.

Baltimore freights are weak, having dropped from $1 to 90 cents to all points. Philadelphia freights have stiffened from 75 cents to 80 cents. The accepted scale, which no one claims to live up to, is, at Baltimore, $2.40@$2.50 f. o. b.; Philadelphia, $2.50@$2.60; in New York harbor, $3.25; alongside, $3.50.

Boston. Sept. 25.

(From our Special Correspondent.)

The conditions of the anthracite coal market remain virtually the same as last week. There is only a fair inquiry for coal, which, as considered by some agents, hardly equals the call of a week ago. The tone of the market is strong, and favors the wholesaler; as a representative coal handler remarked to the writer recently, everything is serene for a good fall business. The chief point of interest to the coal men just now is the probable advance in prices which is being advocated for October 1st. A move of this kind is commonly anticipated by the trade, and it is gauging itself accordingly. Quite a number of transactions are being made with this end considered. The market has freed itself from some of the injurious influences which have been prevailing, and now presents a much improved tone. The demand for egg continues good, and the opportune shortness of this kind has resulted in slightly better prices. Cases are actually known where orders were refused at circular prices. Prices are held strong, and agents show an inclination to ease up on transactions until after the new price has been settled.

The bituminous situation has altered but little since last report, but it is quite evident that a change for the better is anticipated, as most of the agents here display an air of certainty for which there must be some assurance. Another advance in all-rail rates is imminent and is expected at any time. Cumberland continues to be low, but dealers are hopeful and say it must stiffen, in sympathy with freights. At present $3.65 is given as the price on cars; full cargos are obtainable at much lower figures. The market tone seems to be quiet. There are but few large contracts that have not been offered this year. The large consumers who bought for immediate use benefited greatly by the low prices which have been prevailing, and in some cases they do not intend apparently to resume the annual contract system.

Low freights have lasted about as long as they can, and it is evident that the reaction looked for so long is about to set in. In fact, shippers are not striving for business at the present rates, a condition of affairs which shows an improvement. From New York 55@60c. is putting it at the bottom; 75c. from Philadelphia is no inducement, and $1 rules at Baltimore, where orders are plenty. The scarcity of cars is considered seasonable and only temporary.

The retail trade is in comparatively good condition. The recent stormy weather had the effect of temporarily deadening the demand, which, however, is being gradually resumed now that fair weather has appeared. With good fall weather in their favor the dealers hope to do a large business, and there is no reason why they should not. The sheds of all the retailers are holding large supplies. The past week chronicled the arrival of an immense number of cargoes. The feeling among the trade is friendly, and cutting is more the exception than the rule. The action of the wholesalers as regards prices is liable to reflect into the retail trade,

Buffalo. Sept. 25.

(From our Special Correspondent.)

Railroads in this section are complaining of a serious shortage of cars, and considerable delay is experienced in filling orders. The late strike on the New York Central diverted many cars from the ordinary channels. The movement by canals of coal this season is light.

Trade in anthracite coal quiet and prices steady; no advance in quotations anticipated on October 1st. Bituminous coal fairly active at unchanged figures; some varieties difficult to obtain through lack of transportation facilities from the mines. Coke, with usual trade and no incidents worth noting.

Dealers in anthracite anticipate a good fall and winter business, which causes a better feeling to prevail among them.

The New York Central Railroad is adding to the coal handling facilities at Niagara Falls. A new trestle is being built.

Our Common Council has passed an ordinance prohibiting two vessels to lie abreast of the coal chutes of the Delaware, Lackawanna and Western Company on Buffalo River.

The lake line propellers' managers met a few days since to take steps to form a permanent association to look after the interests involved and the protection thereof.

The results of the labors of the Car Service Association for three months shows an average detention of one and a half day per car, as compared with four days at Eastern and eight days at Western points when association was formed.

The propeller "Viking" is credited with carrying, a few days since, the largest cargo of coal that ever passed through the Welland Canal (Canada), viz., 1,858 net tons.

Through the difficulty of obtaining pipes the Canadian natural fuel gas will not be delivered to consumers for four or five weeks yet.

Lake freights unchanged, the 30c. rate to Lake Superior ports continuing. Movement larger than for preceding week. The shipment of coal from this port by lake from September 18th to 24th, both days inclusive, were 83,150 net tons, distributed about as follows: 40,300 to Chicago, 23,380 to Milwaukee, 5,400 to Duluth, 2,340 to Toledo, 1,940 to Detroit, 2,700 to Superior, 2,000 to Gladstone, 500 to Port Arthur, 980 to Sault Ste. Marie, 230 to Perry Sound, 2,000 to Ashland, 600 to Fort William, 130 to Bay City, 250 to Dover, 300 to Port Colburne, and 100 to Alpena; total for the season to date, 1,340,785 net tons. The rates of freight were: 60c. to Chicago, 50c. to Milwaukee, 60c. to Sault Ste. Marie, 85c. to Kenosha, 70c. to Racine, 30c. to Ashland, Detroit, Toledo, Duluth and Superior, 25c. to Bay City, 40c. to Alpena, and 45c. to Port Arthur and Fort William. Closing steady.

Canal movement for third week in September: Receipts, Buffalo, 1,260 net tons, and shipments, 445 net tons.

Chicago. Sept. 24.

(From our Special Correspondent.)

The Chicago coal market is governed by about the same conditions as it was a week ago, and the situation is but little changed. The discouraging scarcity of cars continues, interfering to an alarming extent with shipments from mines and from Chicago docks, and limiting business, while the enormous shortage already reported increases. Prices are consequently very firm, but still unchanged.

We quote as yet: Large egg, $6.25; small egg, range and chestnut, $6.50 at retail, on cars f.o.b. Chicago grate, $5.25; stove, range and chestnut, 5.50; Lehigh lump, $7.

The outlook for bituminous coal is no more flattering than for anthracite, owing partly to the same causes and partly to striking miners. At Brier Hill the strike is still on, and all the miners of Illinois and Indiana are reported ready to go out. The men demand an advance of wages of about 10 per cent. Prices remain unchanged. They are, per ton of 2,000 pounds: Green and Sullivan County (Ind.), shaft, $2.25@$2.40; Jackson Hill, $3.25; Hocking Valley, $3.20; Ohio Central $3; Erie, Brier Hill, $4.25; Indiana block, $2.45@$2.50; Yougiogheny, $3.40; Sunday Creek, $3.20.

Orders for coke are reported much in excess of the supply in this market, owing to the causes noted. There is no change in quotations. Prices at ovens are, furnace coke, $2.15; foundry, $2.45; crushed, $2.65, all per ton of 2,000 pounds f.o.b. cars here. For Connellsville 72 hour, $5.20; domestic crushed, $4@$4.25; Elk Lick, $4.25.

Nashville. Sept. 25.

According to reports a petition has been filed in the United States Court at Nashville, Tenn., under the Anti-Trust law, against the companies owning the mines from which the coal consumed in that city is shipped. The petition alleges that a combination exists to fix prices for the Nashville coal market, and thus control the coal trade in Nashville. It alleges that prices are fixed by the "combine" at which coal shall be sold in Nashville, and that local dealers undertake not to buy from any mining company not a member of the exchange, while the mining companies agree not to sell to any Nashville dealer who is not a member. The coal companies interested are the Jellico Coal and Coke Company, Standard Coal and Coke Company, Memphis Coal and Mining Company, Tennessee Coal, Iron and Railroad Company, and the Cumberland Valley Colliery Company, all of Tennessee, and the Woolbridge Jellico Company, Central Coal and Iron Company, Empire Coal and Mining Company, St. Bernard Coal Company, Mud River Coal and Iron Company, Co-operative Coal Mining and Manufacturing Company, Providence Coal Company, Hecla Coal and Mining Company, and the Green River Coal Company, all of Kentucky.

Pittsburg. Sept. 25.

(From our Special Correspondent.)

Coal.—The market continues firm, with a good trade demand, which is likely to continue for some time. The September shipments were: To Cincinnati, 2,304,000 bushels: Louisville, 2,307,000; total, 4,611,000 bushels—173,833 tons. The principal portion of the above run was sent to New Orleans.

Nominal rates in pools:

	Per 100 bushels.		Per 100 bushels.
1st pool	$4.75	3d pool	$3.90
2d pool	4.50	4th pool	3.25

Railroad coal, $5.00@$5.50.

Connellsville Coke.—The condition of the trade shows little change from the previous week. The car supply shows signs of improvement, which is very acceptable to parties interested. Consumers are still calling for more coke, and fears are entertained that certain furnaces will have to be banked The managers of the various roads are doing all they can to meet the demand. The outlook for the future is very satisfactory. Idle ovens in the region, 2,680, against 3,500 last week. Week's shipments exceed previous week 535 cars; to points west of Pittsburg, 3,650 cars; east of Pittsburg, 1,200; Pittsburg and river points, 1,600.

The rates were for 2,000 pounds f.o.b. cars at ovens: Blast furnace coke, $2.15; foundry coke, $2.45; crushed coke, $2.65.

Freights to Pittsburg 70c. per ton; Mahoning and Shenango Valleys, $1.35; St. Louis, $3.35; Cleveland, $1.70; Chicago, $2.75.

FREIGHTS.

From Philadelphia to: Alexandria, †.85; Boston, .75@.80; Gardiner, Me., .80; Gloucester, .80; Milton, .95; Newburyport, .75; Norfolk, .70; New York, †.90; Portland, *.75; Salem, .75; Washington, †.85.

*And discharging. †Alongside.

METAL MARKET.

New York, Friday Evening, Sept. 26.

Prices of silver per ounce troy.

Sept.	Sterling Exch'ge.	Lond'n Pence.	N. Y. Cts.	Sept.	Sterling Exch'ge.	Lond'n Pence.	N. Y. Cts.
20	4.84½	53¼	1.15¼	24	4.85	52	1.13
22	4.84½	53	1.15	25	4.85	52	1.12¾
23	4.84½	52	1.12¾	26	4.85	51 11-16	1.12

Council Bills declined ¾, being allotted at 1s. 7¾d. per rupee.

Owing to the absence of foreign demand, a lull in the speculative market, and the completion of the government quota before the expiration of the month, silver has declined to $1.12 but as production is not now equal to government absorption the probability is that the surplus on the market will be gradually absorbed, and the prospect is higher prices will by-and-by obtain.

The United States Assay Office at New York reports total receipts of silver for the week to be 70,000 ounces.

Representative Hopkins, of Illinois, has introduced a bill to locate a branch mint of the United States at Chicago for the coinage of gold and silver.

Silver Bullion Certificates.

NEW YORK STOCK EXCHANGE.

	Price. H.	Price. L.	Sales.
Sept. 20	116⅛	115¾	101,000
Sept. 22	115⅛	114⅝	165,000
Sept. 23	114½	113¾	338,000
Sept. 24	113¾	113⅛	100,000
Sept. 25	113¾	112⅛	165,000
Sept. 26	113⅜	112	455,000
Total sales			1,324,000

Domestic and Foreign Coin.

The following are the latest market quotations for American and other coin:

	Bid.	Asked.
Trade dollars	$ .86	$ .88
Mexican dollars	.86½	.88
Peruvian soles and Chilian pesos	.80⅛	.81⅛
English silver	4.82	4.86
Five francs	.94	.95
Victoria sovereigns	4.84	4.93
Twenty francs	3.86	3.90
Twenty marks	4.74	4.78
Spanish doubloons	15.55	15.70
Spanish 25 pesetas	4.78	4.85
Mexican doubloons	15.55	15.70
Mexican 20 pesos	19.50	19.60
Ten guilders	3.96	4.00
Bar silver	1.12¾	1.13⅛

Foreign Bank Statements.

The governors of the Bank of England at their weekly meeting on Thursday raised its rate for discount from 4 to 5 per cent. During the week the bank lost £698,000 bullion, and the proportion of its reserve to its liabilities was reduced from 44 to 41 per cent., against a reduction from 42·52 to 42·15 per cent. in the same week last year, when its rate for discount was 5 per cent. On the 25th instant the bank lost £345,000 bullion on balance. The weekly statement of the Bank of France shows a loss of 12,475,000 francs gold and a loss of 900,000 francs silver.

Copper.—The market here has been rather quiet and we have nothing of interest to report. For Lake copper the price remains firm in first hands at 17c., but a few lots of second hand copprr might have been bought at a trifle below that figure. Reports from consuming districts continue good, manufacturers of wire bars and brass being very busy and a heavier demand is expected for the fall months. If the demands should be about the same as last year, it cannot but be expected that prices will be seriously affected. For Arizona copper the prices are very firm at 15⅝@15⅝, with very little being offered of this description. For casting copper the demand has been decidedly better and prices are unaltered at 14½@14¾.

London closing prices are: spot, £60 10s.@£60 12s. 6d.; three months, £61@£61 2s. 6d. For refined and manufactured sorts, the latest quotations are as follows: English tough, £64@£64 10s.; best selected, £67 10s.@£68, India sheets, £70@£71; strong sheets, £73@£74, and yellow metal at 6½@6⅝.

The exports of copper during the week were as follows:

To Havre—	Copper.	Lbs.	
S. S. La Champagne	524 pigs	113,358	$15,000
	Copper nickel matte.		
S. S. La Normandie	1 cask	1,887	70
To Liverpoool—	Copper matte	Lbs.	
S. S. Alaska	6,074 bags	646,422	65,000
To Rotterdam—	Copper.	Lbs.	
S. S. Obdam	40 bbls.	50,000	8,550
To Bremen—	Copper nickel matte.	Lbs.	
S. S. Ems	6 bbls.	8,601	301

Tin.—The scarcity which we had to report last week has increased, and dealers are almost out of stocks. Steamers which are due during the coming week bring apout 200 to 250 tons of tin, which are eagerly expected. Practically it can be said that stocks remaining in warehouses in New York do not amount to more than 100 tons, and this is a clear proof that consumption has been going on in this country for some time past at a much heavier rate than formerly. Shipments from abroad of which we have advices so far are rather light, and the more so as London is not in a position to ship any large quantities. Spot stocks there are also rather scarce; and under the circumstances, consumers will have to pay a considerable premium for prompt delivery tin for some time to come. We quote to-day spot and September, 25½@25⅝; early October, 24½@24⅝; late October, 23½@23⅝; November, 23@23¼, and December, 23@23¼.

In London prices again show a considerable advance against last week, notably for spot and early delivery for which prices are now quoted at £104 5s.@£104 7s. 6d, being the highest price on record for the past two years. Future tin is still quoted low, and at one time there was a difference of about £3 10s., but in the meantime prices have somewhat advanced, and now £101 is quoted for three months' tin. All reports agree that there are hardly any sellers in London for spot or October tin.

Lead.—The past week has proved that there is not only a scarcity of this metal, but that is more like a famine, and prices in consequence have been driven up quite rapidly, not by any speculative manipulations, but simply by the desire of consumers to secure the article. We refer elsewhere in our to-day's issue as to what has brought about this state of affairs, which now compels us to import lead from Europe in considerable quantities, and which has raised prices to almost an unsound level.

Prices in the West have advanced much more quickly than here this time; but when it was discovered that scarcely any supplies reached Eastern ports from the West, prices followed very quickly, and now we are on a level where foreign lead can be imported to advantage. Early in the week sales took place at about 5c. to 5·5c., but during the last few days there has been a scramble for spot lead, and we close nominally at 5·15 to 5·25.

The London market stood at the beginning of the week at £13 10s.; since that time the buying for American account has greatly stiffened the market, and the closing quotation is £14, but hardly any Spanish lead is to be had even at that price, especially for prompt shipment.

The St. Louis Lead Market.—Messrs. Wahl & Co. telegraph us as follows: "Lead is very scarce, and for immediate delivery it is practically not to be had. A few stray car loads sold as high as 5·10c."

Spelter is also higher, and offerings are light; besides the higher freights from the West make the laying down price rather higher, and we now have to quote 5·75@5·80c.

The foreign market is reported very firm, good ordinaries being quoted at 24·15, and specials at 25.

Antimony.—Is unchanged. We quote "Cookson's at 23½@24c.; "L. X." at 20·75@21c., and "Hallett's at 20@20¼c.

Nickel.—There is no alteration.

Quicksilver.—New York and London quotations are $56@$56.50 and £10 10s., respectively. There has been considerable of the Spanish article imported recently in anticpation of an increased tariff after October 1st. California's production has fallen off so much of late that it has been necessary to increase the supply by heavy importations.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, September 26.

The New York Metal Exchange's market report aptly sums up the condition of the New York iron market in two words: "Iron neglected." Rarely in the history of this market has the fall activity been so late in asserting itself. With one or two exceptions every branch of the trade is duller now than at any former period of the year, which is a state of affairs that none in the business seem able to account for. Generally, however, the tone of the market is firm, but this is accounted for by the fact that stocks are small. The test of the firmness, in the shape of new business, is anxiously expected.

American Pig Iron.—The market continues dull, business being confined to small lots, but at fully quoted prices. Makers of the best brands report business fairly good, but admit that stocks are short. What buyers there are in the market continue to hold off for a shading of 50 cents to $1, but sellers do not make concessions. No concessions whatever are made on No. 1 iron, but several small sales of inferior qualities are reported at a slightly lower price than we quote. These, however, are not sufficiently authenticated to indicate a real reduction in price. We quote prices same as last week: No. 1 Southern, $17@$18; $16.25@$16.50 for No. 2, and $15.25 for No. 3. Southern carwheel iron, Nos. 3 and 4, brings $20.25, with nothing doing of any importance. In Northern pig iron little is doing, but quotations are made of $18@$18.50 for No 1, and one dollar less for No. 2.

Scotch Pig Iron.—Scotch pig iron is scarcely noticed in the market now. The increase in price of English coal and iron, and the recent comparative scarcity of the latter no doubt account for this, though as a matter of fact the amount of Scotch pig imported here has for some time been growing smaller and smaller. The news received a few days ago that the Scotch furnacemen were on strike will naturally tend to still further increase foreign prices. Prices quoted are merely nominal: No. 1 Coltness, $24.50; Dalmellington, $22; Eglinton, $21.25.

Spiegeleisen and Ferro-Manganese.—The stiffening in European prices and the dullness in this market here has resulted in reduced importations. At present prices the buyers are few, though sellers firmly maintain their demands. Most of the steel manufacturers are sufficiently supplied for some time to come, and are not expected as buyers at present. We quote: For 20 per cent. spiegeleisen, German, $30.50; for English, $31.50. For ferro-manganese, 80 per cent., $71 is quoted in various quarters, with an impression that $70.50 would buy.

Steel Rails.—In consequence of the almost entire absence of business, steel rails are decidedly weak. Several small lots are reported as changing hands at $30.50, but sellers would not be slow in accepting $30, which we quote as the market price.

Rail Fastenings.—Though prices have not fallen since last week, rail fastenings are weak, with no business doing worth mentioning. The business was never duller, and the prices we quote are but nominal in the absence of any transactions to report: Spikes, 1·95@2c.; angle plates, 1·72@1·76c.; bolts and square nuts, 2·70c.; hexagonal nuts, 2·90@2·95c.; complete joint, iron and steel, according to weight.

Tubes and Pipes.—This branch of the iron trade is a notable exception to the general dullness. All the manufacturers are working to their full capacity to keep up with the constantly increasing demand. The association, satisfied with present prices, will maintain them as we quote for some months yet, unless the raw material should rise with the expected fall and winter trade. The scare in the building trades through the brick boycott has had no effect on the business in tubes and pipes. "If it had," said the representative of one company, "we could find plenty of outlet for our product, which we cannot supply now." Ruling discounts on car lots: 47½ per cent. on butt, black; 40 on galvanized; 60 on lap, black, and 47¼ on lap, galvanized; 40 on 1¾-inch boilers; 50 for 2 to 4-inch and 52½ on larger than 4-inch casing, all sizes, 50 per cent.

Merchant Steel.—Business in merchant steel is now at the fluctuating stage between dulness and activity. Trade, however, has improved of late sufficiently to stiffen, if not to enhance, prices. An early rise is looked for. Prices remain; Best English tool steel, 15c. net; American tool steel, 7½@10c.; special grades, 13@20c.; crucible machinery steel, 5c.; crucible spring, 3¾c.; open-hearth machinery, 2¾c.; open-hearth spring, 2¾c.; tire steel, 2¾c.; toe calks, 2¾c.; flat file, 4¾c.; mill file, 5¼c.; taper file, 7¼c.. first quality sheet, 10c.; second quality sheet, 8c.

Old Rails.—No transactions of any note are reported for the week. One lot 400 tons from abroad was landed in Jersey City at $25, but it would be difficult to secure any quantity in this market at a lower figure than $25.50. Several thousand tons are ready for buyers at $26, which sellers do not seem to be able to obtain yet, despite the scarcity.

Scrap Iron.—Very little, if any, scrap iron seems to be moving, which would justify quotations as market prices. First-class yard scrap is said to be offered anywhere between $21 and $23.

Structural Iron and Steel.—There was some expectation that the partial cessation of building operations through strikes, boycots and labor troubles would affect the business in structural iron and steel. But the result proves that this was not the case. All the manufacturers continue working to the full limit and in several cases are unable to meet the growing demand. Prices seem satisfactory to all concerned, and it is not expected they will be changed yet, unless, as in the case of tubes and pipes, the price of the raw material should go up in the localities from which the makers draw their supplies. We quote: Universal plates, 2·20@2·28c.; bridge plates, 2·15@2·20c.; angles, 2·10@2·15c.; tees, 2·6ic.; beams, 3·10c.

Chicago. Sept. 24.

(From our Special Correspondent.)

The great iron, steel and allied industries centered in the Chicago market are fully employed. The demand for finished iron in all its various shapes continues unabated. Coming, as it does, from many sources, there is nothing that might be called a boom in the present prosperous condition; it comes from a legitimate growth of business. Prices are well maintained. Finished irons are selling higher than they did a year ago, while the crude metal remains practically unchanged, with but little prospect of any further advance. Some of the lower grades of pig may be said to be somewhat weak in spots.

Pig Iron.—The market is quiet. The amount of buying during the past week has not been large. Some fair sized blocks of Southern coke have been placed. Silvery irons and softeners are in fair request, while Lake Superior charcoals are inactive. Some slight concessions are reported offered by certain coke furnaces for early deliveries. All companies in this district are firm as to business for scattered deliveries. A large amount of activity is found among all melters of iron. While there is at present a scarcity of large orders, a good demand for small lots is noted. Furnaces are shipping their product as fast as circumstances will allow; some are even refusing orders for December, and can afford to maintain their position firmly. Dealers in Haselton Scotch are having considerable inquiry for mill iron. There is also a good demand with firmer prices for foundry iron. We quote to-day for cash per ton of 2,240 pounds, f.o.b. Chicago, for Nos. 1 and 2, Lake Superior charcoal No. 3, for car wheels, Nos. 4 and 5 for malleable, $20@$21; Lake Superior coke Bessemer, $18.50; Lake Superior coke Bay View No. 1, $17@$17.50; No. 2, $16@$17; No. 3, $15.50@$16; Southern coke No. 1, $16.50@$17; No. 2, $16@$16.50; No. 3, $15.50@$16; Southern charcoal, $19@$19.50; standard Southern car wheel, $22@$24.50; Ohio softeners, Hanging Rock, $18@$18.50; Jackson County, $18@$19; Hanging Rock cold blast, $26@$28; warm blast, $23@$25; No. 1 Scotch, according to brands, $26@$27; American Scotch, $19@$20; Bay View Scotch No. 1, $18; No. 2, $17; Chicago Scotch No. 1, $17; No. 2, $16; Emma Scotch, $19@$19.50; black band, Hubbard Scotch, $19; Haselton, $19; soft silvery, $18; Wellston No. 1, $19; No. 2, $18.50@$19; Hamilton No. 1, $19.25@$19.75; Norton No. 1, $17.75@$18.25; Zanesville No. 1, $18.75@$19.25.

Bar Iron.—Demand active and bidding keen. Prices are very firm and mills are far behind on orders, with every indication of being fully employed during the balance of the year. Local mills are still quoting $1.90 for half extras. Valley mills ask $1.75 at mill with half extras. Here $1.80 is the ruling price for car iron. Store trade continues good, and dealers ask $2.10@$2.20, according to quality and quantity.

Structural Iron.—Stimulated by the general activity in building, the trade in these materials continues heavy; prices very firm. We continue to quote: For car lots, f. o. b. Chicago iron and steel angles, $2.35@$2.40; Universal plates, $2.55; sheared plates, $2.50; tees, $2.75@$2.85; beams and channels, $3.20. Store prices are: Angles, $2.50@$2.60; tees, $2.80@$2.90, and beams and channels, $3.50@$3.70. A number of large specifications have been received from St. Louis, and some large structures are yet to be let here. Among the latter is the Masonic Temple, to be eighteen stories high.

Black Sheet Iron.—Mills are very busy and still so far behind on old orders that prompt delivery cannot be obtained. No. 27 f. o. b. mill is now firmly quoted at $3.05@$3.10 for car lots, the

freight on which is 15 cents. Dealers are very busy and stores sell small lots at $3.20 for No. 24; $3.30 for Nos. 25 and 26, and $3.40 for No. 27. Smooth sheets at stores also maintain the schedule of 60c. per hundredweight.

Galvanized Sheet Iron.—Mills are overcrowded with work and cannot take care of new business, particularly for immediate delivery. Prices are very firm. Discounts on both cheap and standard brands are still 62½ per cent. on Juniatta, and 62½ and 5 per cent. on charcoal from stores.

Merchant Steel.—Business continues very good, and the flow of orders unabated. Large firms of machinery and engine builders are using large quantities of steel. In consequence trade from these lines is particularly heavy. A good demand for merchant steel continues at full prices. Some desirable contracts have been placed lately. A number of implement manufacturers are yet to be heard from. We quote as follows: Tool steel, $7.75@$8; specials, $12@$25; open-hearth machinery, $3; Bessemer machinery, $2.50@$2.70; open-hearth spring steel, $2.75@$2.80; tire, $2.50@$2.60; toe calk, $2.70@$2.80; sleigh shoe, $2.40@$2.50; cutter shoe (T. & B.), $2.65@$2.70; crucible sheet steel, $7@$10; crucible spring, $3.75.

Plates, Tubes, etc.—A good demand continues for this class of iron, and dealers adhere firmly to last week's quotations. Prices are: tank iron, $2.70; tank steel, $2.90; heavy sheets from 10 to 14, $2.90@$3; steel sheets 10 to 14, $3.25@$3.50; shell iron, $3@$3.25; flange iron, $4@$4.25; flange steel, $3.50; shell steel, $3.25; boiler rivets, $4@$4.25; fire box iron and steel, $4.75@$5.50; boiler tubes, 4½ inches and larger, 52½ per cent.; 2 to 4 inches, 50 per cent., and 1¼ inches and smaller, 45 per cent.

Nails.—At mills $1.85 is now the bottom figure. Some mills are reported shut down on account of the existing low prices, and an advance of $2 per keg is looked for. The demand is excellent and trade very satisfactory. Freight from Wheeling is now 18½ cents per keg. At stores quotations continue at $2.05@$2.10, but these prices will most likely be advanced soon. Wire nails show a little less firmness at mills; $2.40@$2.45 is asked, and $2.60@$2.65 are common quotations at the stores.

Steel Rails.—Some new inquiries are reported but the market remains much the same as a week ago. Demands are mostly for small lots for immediate delivery. Orders have been quite numerous, aggregating a considerable tonnage. The price for this class of trade is $34 however, pending inquiries from Northwestern and Western roads, under the prevailing competition, will be probably filled either here or elsewhere at a less figure.

Railway Track Supplies—Prices are firm under a good demand. We quote iron fish plates $2.05@$2.10; steel fish plates $2.20@$2.25; bolts square nuts $3.00; hexagon nuts $3.10@3.15, according to quantity; spikes $2.20@$2.25.

Scrap Iron.—Business in this direction is assuming a more satisfactory condition and the outlook is excellent. We quote as follows: Country mixed scrap, $15.50@$16.50, according to condition; No. 1 mill, $14@$14.50; light wrought, $9@$9.50; horseshoes, $19@$19.50; axles, $26; cast machinery, $13@$14; stove plates, $9.50@$10; borings, $9.50@$10; wrought turnings, $13.50; No. 1 railroad shop or forge, $21.50; track scrap, $19.50@$20.

Old Wheels and Rails.—A stead demand exists and sales are comparatively good. Prices remain unchanged at $27 for old iron rails f.o.b. Chicago. Old steel rails command $19.50@$22.50, according to length, condition, etc.; guards and frogs, $18.50@$19. Old car wheels are quiet, and are bringing $19@$20.

Louisville. Sept. 23.

[Special Report by Hall Bros. & Co.]

The market is quiet and the bulk of business has ranged from car loads to 200 and 300 ton lots. Foundry irons are scarce. The furnaces seem now well sold up for several months on almost all grades and are still hopeful and confident of a better market. We are of the belief that there will be an active market during the early fall and winter seasons. The tight money is doubtless holding many out of the market, though we feel that money will soon be plentiful and at easy exchange, when we look for an active iron trade.

Hot Blast Foundry Irons.—Southern coke, No. 1, $15@$15.25; No. 2, $14.25@$14.50; No. 3, $14@$14.25. Mahoning Valley, lake ore mixture, $17.75@$18.75; Southern charcoal, No. 1, $17@$17.50; No. 2, $16.50@$17. Missouri charcoal, No 1, $18@$18.50; No. 2, $17@$17.50.

Forge Irons.—Neutral coke, $13.75@$14; cold short, $13.75@$14; mottled, $12.75@$13.25.

Car Wheel and Malleable Irons.—Southern standard brands, $22@$23; other brands, $18@$19. Lake Superior, $22.50@$23.

Philadelphia. Sept 26.

(From our Special Correspondent.)

Pig Iron.—Heavier transactions have been the order of the day for several days past. In consequence there is a noticable improvement in prices, especially among the standard brands. Among a few inferior brands the weakness heretofore noted continues. The negotiations, or rather correspondence, concerning Southern irons has not resulted in any arrivals outside of a little on old orders. The market is strong, taking it all through, especially for forge, which sold within forty-eight hours at full $15.50, though there is fair iron going at $15. No. 2 is going more freely at $16.50@$17, and agents think they have a good business in sight. No. 1 is $18, though poor material can be had a little less. It is hard work to move Bessemer at any price. Several lots are available at $18.50.

Foreign Material.—Spiegel will not draw out buyers at more than $30 or $30.50. Ferromanganese would be taken at $68.

Muck Bars.—Sales footing up 1,500 tons at $29.50 have been made within a few days.

Merchant Bars.—The steady demand for merchant iron has had a hardening tendency in prices, but no pronounced advance has been made. Stores have been getting 2 cents for two weeks or more. Mill prices run from 1·75@1·85 according to quality. Much new business is in sight.

Nails.—A fair demand is kept up at $1.85@$1.90 in large lots.

Skelp.—An advance has worked itself out and grooved sold yesterday at as high as 2·05 in one instance. Sheared skelp ranges from 2·20@2·25.

Wrought Iron Pipe.—Business is crowding in and discounts are never questioned.

Sheet Iron.—Most of this week's retail business has been done at a slight advance over last week's figures, and a change in card rates has been talked of.

Plated Tank.—A run of small orders has been going on since Monday, and some heavy contracts will probably be placed next week, as bids have been sent in on specifications received some time ago. Iron bridge plate, 2·30; steel, 2·50; flange, 3·10; tank, 2·25@2·50.

Structural Iron.—The satisfactory condition of things continues, and plenty of new business is offered. Angles, 2·25; sheared plates, 2·40; tees, 2·75; beams and channels, 3·10.

Steel Billets.—Quoted at $31@$32; slabs, $31.50.

Steel Rails.—Moderate lots quoted at $31@$31.50; large lots, $30.50. Nothing especially new.

Old Rails.—Steel quoted at $25.50. No business.

Scrap.—No. 1 is offered at $21.50.

Pittsburg. Sept. 25.

(From our Special Correspondent.)

Raw Iron and Steel.—The demand for raw iron was not so active as the preceding week; buyers for certain d scriptions were inclined to hold off, unless concessions were made; holders on the other hand were not inclined to accept lower figures; the result was, sales don't show up as well as we would like. Manufactured iron was firm with an active demand. There was no exception, and mills in most directions are crowded with work. Under such conditions prices are, of course, well maintained. The demand for muck bar continues liberal at the advance previously noted; sales show plainly that consumers don't intend to be short of that article. The consumption of the raw is the largest in the history of the trade. Production is being carried on on a very liberal scale, far in excess of any previous year.

Steel Billets and Slabs.—Prices are not so firm, neither is the anxiety to purchase so great as was the case a short time since; still taken as a whole, there is little reason for complaint. The sales for the present month were unusually large; holders generally are inclined to hold out for last week's prices. Bessemer iron shows signs of weakness; buyers are evidently supplied for the present, that evidently is the reason for asking for concessions at the same time. Sales reported are at last week's figures. Pig iron was not fancied to any great extent; consumers are willing to purchase when the figures meet their views. Certain makers insist that prices are unreasonably low; some of them refuse to sell at the rates at which certain descriptions are being disposed of as a general thing. They are not known as standard descriptions, and fail to command full rates.

Skelp Iron.—The market was active, sales steady at full rates. Steel wire rods are not so firm; sales show a slight declines in values.

Old Iron Rails.—The demand was fair and sales regular, last week's prices being maintained; the offerings have been light. Scrap material steady with a good demand; prices the same as ruled last week. Spiegel shows signs of weakness; holders are accepting lower figures. The outlook at the moment: There is no unusual pressure to sell standard brands, and there is no reason why prices should not be maintained here, being so extremely low that a further decline seems out of the question. The market, while not at all buoyant, is certainly steady, and if no unfavorable developments are met with, the close of the year may show a range of prices favorable to makers.

Coke Smelted Lake and Native Ores.

3,000 Tons Bessemer, Oct., Nov., Dec	18.00 cash.
1,500 Tons Grey Forge	15.15 cash
1,000 Tons Grey Forge	15.50 cash
1,000 Tons Bessemer No. 1	18.50 cash.
1,000 Tons Grey Forge	15.00 cash.
1,000 Tons Grey Forge	15 25 cash.
1, 00 Tons Grey Forge	15.10 cash.
500 Tons Grey Forge	15.25 cash.
500 Tons Bessemer	18.25 cash.
500 Tons Grey Forge	15.15 cash.
500 Tons No. 1 Foundry	17.25 cash.
500 Tons No. 2 Foundry	16.25 cash.
400 Tons No. 1 Foundry, all ore	18.00 cash.
400 Tons No. 2 Foundry, all ore	17. 0 cash.
300 Tons Bessemer	18.25 cash.
200 Tons No. 3 Foundry	15.50 cash.
200 Tons White Iron	14.50 cash.
100 Tons Silvery Extra	19.50 cash
100 Tons Silvery	17.50 cash.

Charcoal.

100 Tons Cold Blast Southern	27.00 cash.
100 Tons Cold Blast	28.00 cash.
100 Tons No. 1 Foundry	22 50 cash.
100 Tons No. 2 Foundry	23.50 cash.

Muck Bar.

5,000 Tons Neutral, Oct. to Feb	30.25 cash.
2,500 Tons Neutral, Nov., Dec	30.00 cash.
2,000 Tons Neutral, Oct. to Feb	30.25 cash.
1,500 Tons Neutral, Oct., Nov	30 50 cash.
750 Tons Neutral, Sept., Oct	30.60 cash.
500 Tons Neutral, Sept., Oct	30.50 cash.
500 Tons Neutral	30.50 cash.

Steel Billets and Slabs.

2,000 Tons Billets, Sept, Oct	30.70 cash.
2,000 Tons Billets and Slabs, Oct., Nov	30.40 cash.
500 Tons Billets	31.00 cash.
200 Tons Billets, Wheeling	30.00 cash.
100 Tons Billets, Wheeling	30.00 cash.

Steel Wire Rods.

500 Tons American Fives	41.75 cash.

Ferro-Manganese.

200 Tons 80 per cent., Baltimore, Nov., Dec.	69.00 cash.
50 Tons 80 per cent., Baltimore, Dec	62.25 cash.

Bloom Ends.

1,000 Tons Bloom Ends, Oct. to Feb	21.50 cash.

Crop Ends.

1,000 Tons Crop Ends, Oct. and Jan	21.000 cash.

Skelp Iron.

500 Tons Sheared Iron	2.25 4 mo.
500 Tons Wide Grooved	1.95 4 mo.
225 Tons Narrow Grooved	1.87½ 4 mo.

Old Iron Rails.

700 Tons American T's	28.10 cash.

Scrap Material.

400 Tons No. 1 Wrought Scrap	net 22.75 cash.
200 Tons Leaf Steel	net 23.50 cash.
100 Tons Iron Axles	net 29.50 cash.
100 Tons Iron Axles Extra	net 32 00 cash.

CHEMICALS AND MINERALS.

NEW YORK, Friday Evening, Sept. 26.

Heavy Chemicals.—In regard to the general condition of the market for heavy chemicals the most noticeable feature is the smallness of the spot supply. In some cases it amounts to actual scarcity. The general demand is good, although some buyers appear inclined to think that prices will be lower ere long. Consequently they pursue a hand-to-mouth policy in supplying their wants.

The daily press published this week a cable despatch from London, which was to the effect that the prospectus of the new Chemical Union had been issued, showing a capital of £8,500,000, of which £7,000,000 would be issued against the works, etc., and the remainder against the stocks of chemicals and for a working capital.

This positive announcement was looked upon by the trade as somewhat premature. None of the dealers, prominent or otherwise, in the city have received confirmatory private advices. At any rate it does no harm. The issue of the prospectus is merely a matter of time. The "Chemical Union" is an established fact. Its advantages and disadvantages have already been discussed in this column, hence the omission this week of further comments on the subject.

Caustic Soda.—On the spot caustic soda is scarce. The demand has been good, though many buyers profess the belief that prices will rule lower in the near future. Quotations are: For 60 per cent., October shipment, 3·48@3·50c.; 74-76 per cent., on the spot, 3·25@3·40c.; October shipments, 3·17½@3·20c.; 77 per cent., 3·25@3·40c. on the spot.

Carbonated Soda Ash.—This article is in good demand, both for spot and future delivery. Quotations are, for the 48 per cent. variety, 1·57½c.@1·60c., and 58 per cent., 1·47½@1·50c., with a limited spot supply in both.

Caustic Soda Ash.—There is not a very great demand in this. Quotations are 1·45@1·50c.

Bleaching Powder.—A better feeling is observable in bleach, which is quoted this week at 1·57½@1·62½, according to quantity and brand.

Sal Soda.—A good demand and a small supply has advanced the price of sal soda. Quotations show a rather wide range, dealers offering it all the way from 1·10c.@1·25c.

Acids.—No improvement, especial or general, is to be noted in the acid market. The volume of business is by some dealers reported to be everything that could be desired, while others assert that the trading has been light, but it is unanimously agreed that prices are as low as ever, if not lower.

Rumors anent the combination have once more circulated among the trade. It is stated by an officer of the Knickerbocker Chemical Company that the company, as to membership, continues unchanged. It seems settled, however, that a new plan of conducting operations has been de-

cided upon. Outsiders do not appear in the least troubled by this knowledge, nor, indeed, is there any reason why they should. The Knickerbocker Chemical Co. has not of late caused much anxiety. If it has made mistakes, and who has not? it is possible that it realizes them now, and perchance it has determined to mend its ways. There is no inclination on either part to pursue an aggressive policy. The following are the ruling quotations: Acid, per 100 pounds in New York and vicinity: Acetic, $1.72½@$2.20; muriatic, 18-degree, 80c@$1.-20; muriatic, 20-degree, 90c.@$1.50; muriatic, 22-degree, 90c.@$1.75; nitric, 36-degree, $2.75@3.25; nitric, 40-degree, $3.25@$4.50; nitric, 42-degree, $3.75@$4.75; sulphuric, 60-degree, 70@80c., and sulphuric, 66-degree, 80c.@95c.

Fertilizing Chemicals.—There is a better feeling in the market for fertilizers, and the demand has been brisker. The past season has not been as good as dealers expected, but this is due to natural causes. Farmers in some sections have had poor crops, and in others they have labored under an indebtedness, which they have tried to liquidate. Again, there was trading going on during the whole summer, not much, it is true, but it has taken away from the usual fall trade. Quotations are as herewith given: High grade dried blood, $1.80@$1.85. For the low grade the price is $1.70@$1.75. Azotine, $1.85@$1.90. Tankage, high grade, 9 to 10 per cent. ammonia and 15 to 20 per cent. phosphate, $19@$20 per ton, and low grade 7 to 8 per cent. ammonia and 25 to 30 per cent. phosphate, $18.25@$18.75. Fish scrap, $20@$20.50 per ton f. o. b. factory. Sulphate of ammonia, prime gas liquor, $3.35; prime bone liquor, $3.15. Concentrated tankage, $1.67½@$1.70. Refuse, bone black, guaranteed 70 per cent. phosphate, $18 per ton. Dissolved bone black is nominally 95c. per unit for available phosphoric acid, although on large lots prices might be somewhat reduced, and acid phosphate 80c. per unit for available phosphoric acid. Steamed bones, unground, $20@$23; ground, $25@$26.

Charleston rock continues short with a consequent upward tendency. Quotations: Undried, $6 per ton; kiln-dried, $7 per ton, f. o. b. vessels and cars, $6.50@$7.25. Freights by sail from Charleston to New York, $2.75@$3.50 per ton. Charleston to New York, ground, $11.75@$12.25, ex-vessel at New York.

Sulphate of potash 48 to 52 per cent. is quoted at $1.12½ per 100 pounds; manure salts, high grade, basis 90 per cent. have been in good request at $2.37½ per 100 pounds.

Mr. Paul C. Trenholm, of Charleston, S. C., sends us the following interesting statistics, showing shipments of phosphate rock from Charleston and Beaufort, S. C., during September 1st, 1889, to August 31st, 1890:

Charleston.	Crude.	Ground.
Domestic	188,534	1,288
Foreign	48,740	Nil.
Total	237,274	1,288

Beaufort.	Crude.	Ground.
Domestic	54,475	Nil.
Foreign	158,188	Nil.
Total	212,663	Nil.

Total shipments: Crude, 565,937: ground, 1,288.

Shipments and consumption of phosphate rock from and at Charleston and Beaufort, S. C., from Sept. 1, 1886, to Aug. 31, 1890.

1886.	1887.		1888.		1889		1890.
Crude.	Gr'nd.	Crude.	Gr'nd.	Crude.	Gr'nd.	Crude.	Gr'nd.
439 586	5,785	437,635	5,430	505,158	3,550	565,937	1,288

Messrs. Millar & Co., of Montreal, send us notice that shipments of phosphate from Montreal from August 20th to September 24th, as per Custom House manifests, is 2,810 tons.

Muriate of Potash.—Arrivals at various ports, aggregating some 650 tons, are reported this week, as are also sales of 200 tons. Quotations remain unchanged at $1.77½@$1.82½.

Nitrate of Soda.—There is a better demand for nitrate, and stocks are very much reduced. Recent sales have amounted to between 15,000 and 20,000 bags. The price has advanced to $1.80 ex-store.

Brimstone.—The market for brimstone is quiet but strong. Quotations for October and November shipments are: $21.25@$21.50 for best unmixed seconds and $29.50@$20.75 for seconds, while for spot delivery a higher figure is asked.

Liverpool. Sept. 17.

[Special Report by Messrs. J. P. Bruner & Co.]

There is a good inquiry for most lines of heavy chemicals, but business is checked owing to scarcity of supplies for prompt delivery.

Soda ash firm and difficult to find sellers for this month. Quotations range as follows: Caustic ash, 1¼d.@1½d.; carb. ash, 1 5-16d.@1½d. according to brands.

Soda crystals are selling at £3 5s.@£3 7s. 6d. per ton, but the demand is not active.

Caustic soda very strong, as manufacturers have nothing to sell for September, and are also reported to be well sold for next month. In 70 per cent. some resales have been made for prompt delivery at £11 5s., but it is now difficult to find any second-hand lots even at this figure. Sixty per cent. is scarce at £10 5s.@£10 10s., and no 74 per cent. offering for this month. For October quotations range as follows:

Sixty per cent., £10@£10 10s.; 70 per cent., £11@£11 10s.; 74 per cent., £12 5s.@£12 10s. Sales reported to-day in 70 per cent. for October at £11 2s. 6d. up to £11 5s.

Bleaching powder is dull at £5 15s.@£6, and business done at the lower figure. At the same time there is very little hardwood offering for this month.

Chlorate of potash is held for 5d. per pound for prompt delivery, and 5¼d. asked for October.

Bicarb. soda is unobtainable for this month, and £6 per ton for one-hundredweight kegs is the price asked for early October delivery.

Sulphate of ammonia is scarce on the spot, and £12 per ton nearest value for good grey 24 per cent. for double bags f. o. b. here, while possibly sellers might be found at 5s. per ton less money for October.

The meeting of the chemical manufacturers, held here on the 12th inst., is reported to have been very satisfactory, but makers decline to give any information as to the result of same. They state, however, that there is now no doubt but that the "Chemical Union" will be successfully floated, and all arrangements are expected to be completed by the end of next month.

BUILDING MATERIAL MARKET.

NEW YORK, Friday Evening, Sept. 26.

The state of uncertainty which has demoralized the market for building materials continues. When the brick difficulties will be finally settled it will be too late in the year for much building to be carried on, hence the troubles have been of much injury to the market.

Lime.—Quite a fleet arrived from the Maine districts and their cargoes were speedily disposed of. There is still a better demand than supply as lime burners are afraid of the present condition of the market. A similar complaint is heard from St. John, N.B., lime people. They have decided to ship no more lime to this market for some time to come. Quotations are as last week: For Rockland common, $1@$1.20; St. John, common and finishing, 90c.@$1; Glen Falls, common and finishing, 90c.@-$1.10.

Bricks.—Very little change is to be noted in the brick difficulties. The Manufacturers' Association asserts that less "sucker" brick is coming in, and that victory on their part is merely a question of time. A firm or two which hitherto had held aloof from the association have now joined. The Grand Jury began on the 25th instant an inquiry into the boycott instituted against the four manufacturers of brick at Verplank's Point by the walking delegates of the Brick Handlers' Union. It is understood that the complainants are members of the Brick Manufacturers' Association, who are boycotting this market. A meeting of the manufacturers was to have taken place this morning, but at the time of our going to press no meeting has been held. It is impossible to give quotations which will be a criterion of the actual buying and selling. Nominally they are the same; we quote: Haverstraws, $6.25@$7; uprivers, $6@$6.75; Jerseys, $5.75@$6.50; pale, $3@$3.25.

Cement.—The market for cement in sympathy with other branches of the market for building materials is rather quiet, but dealers express a conviction that the near future will see an improvement. Quotations remain unchanged, and we accordingly repeat them: Rosendale, 90c.@$1; Portland, American, $2.15@$2.45; foreign, $2.40 @$2.50; special brands, $2.60@$2.85; Roman, $2.75 @$2.95; Keene's coarse, $4.50@$5.50; Keene's fine, $7.25 @$8.50 per barrel.

IMPORTS AND EXPORTS OF METALS AT NEW YORK FROM SEPTEMBER 13 TO SEPTEMBER 20 AND FROM JANUARY 1.

IMPORTS.

Spelter.	Week. Tons.	Year. Tons.
Amer. Metal Co	25	322
Hendricks Bros		50
La Marche's Sons, H		5
Lewisohn Bros	50	150
Meyer, G. A. & E.		9
Milne & Co		74
Muller, Schall & Co		123
Total	75	733
Corres. date, 1889		685

Pig Lead.	Lbs.	Lbs.
Bruce & Cook		25
Caswell, E. A		211
Hendricks Bros		100
Naylor & Co		10
Schultz & Co., A		98
G. W. Sheldon		149
Total		593
Corres. date, 1889		251

Tin.	Tons.	Tons.
Abbot, Jere, & Co		125
Amer. Metal Co		2,125
Bidwell & French	50	1,015
Bruce & Cook		10
Carter, Hawley & Co		80
Cohen & Co., A		10
Cohen, H		20
Cort & Co., N. L		125
Crooks & Co., R		85
Davol & Son		34
Hendricks Bros	10	42
Knauth & Kuhne		10
Lehmaier, S., & Co		122
Lewisohn Bros		20
Merchant & Co		50
Muller, Schall & Co		620
Naylor & Co		1,336
Nissen, Geo		10
Phelps, Dodge & Co	50	2,796
Thomson, A. A. & Co		50
Thomson, D. & Co		70
Townsend, & Co., J. R		50
Trotter & Co, N		75
Total	110	8,880
Corres. date, 1889		7,876

Tin Plates.	Boxes.	Boxes.
Adams & Westl'ke Co		70
Bruce & Cook	967	97,825
Byrne & Son		1,000
Central Stamp. Co	1,181	53,141
Coddington & Co	7,477	112,443
Cohn & Co		14,487
Con. Fruit Jar Co		120
Corbiere F. & Co		7,707
Cort & Co	7,592	159,128
Crooks & Co	1,337	73,551
De Milt & Co, H. R	520	7,997
Dickerson, V. D. & Co	8,434	292,472
Fenton, D. E	250	3,890
Haberman, F		66
Herring, Chas. E		1,000
Iron Clad Mfg. Co		489
Lalance & G. M. Co		9,010
Lazard Bros		1,048
Lehmaier, Schw'z & Co		200
Merchant & Co		22,522
Mersick & Co	280	10,008
Morewood & Co	1,000	39,739
Newell Bros		416
Payne, S. H. & Co		934
Pratt Mfg. Co		95,271
Phelps, Dodge & Co	15,114	618,710
Schneider & Co., J		3,365
Shepard & Co	1,615	13,021
Standard Oil Co	2,212	7,906
Taylor, N. & G		1,229
Thomson & Co., A. A.	1,558	24,209
Warren, J. M		4,868
Wheeler & Co		25,827
Whittemore & Co	330	14,0 6
Wolff & Reesing		2,077
Wright, Peter & Co		227
Total	49,867	1,779,789
Corres. date, 1889	30,708	1,722,883

Pig Iron.	Tons.	Tons.
Abbott & Co., Jere		250
Baldwin & Co., A		807
Baldwin Bros. & Co		170
Crocker Bros	115	1,515
Crooks & Co., R		5
Dana & Co		150
Drummond & Co		400
Geisenheimer & Co		76
Hagermeyer & Brun		30
Henderson Bros		100
Irvin. R. I. & Co	100	400
Lillienberg, N	500	2,409
Naylor & Co		150
Perry & Reyer		53
Pierson & Co		30
Sheldon, G. W. & Co		200
Stetsson & Co., G. W		2,425
Williamson, J. & Co		1,650
Total	715	10,820
Corres. date, 1889	300	24,297

Steel Blooms, Billets, and Slabs.	Tons.	Tons.
Abbott & Co	228	233
Baldwin Bros. & Co		2
Dana & Co		1,670
Dolge & Co., A		1
Downing, R. F. & Co		109
Henderson Bros		1
Holt & Co., H. N	4	4
Martin & Co		80
Milne, A., & Co	157	225
Naylor & Co	345	794
Pope, Jas. E., Jr		61
Richards & Co., C. B		1
Roebling's Sons, J. A		2,074
Wolff, & Co., R. H		60
Total	734	5,315
Corres. date, 1889		23,199

Bar Iron.	Tons.	Tons.
Abbott & Co., Jere		796
Bacon & Co		1,155
Crocker Bros		77
Dickerson, Van Dusen & Co		6
Downing & Co		285
E. J. Jacobus	96	104
Fuller, Dana & Fitz		11
Holt, H. N		180
Lilienberg, N		447
Lundberg, G	131	2,302
Milne & Co	116	1,132
Muller, Schall & Co		289
Naylor & Co	28	604
Page, Newell & Co		1,855
Plenty, J		14
Wilson, J. G		3
Total	371	9,260
Corres. date, 1889	190	8,909

Scrap Iron.	Tons.	Tons.
Baldwin Bros. & Co		7
Crossman & Co., W. H		30
Frankfort, M		232
McDougall & Potter		92
Muller, Schall & Co		18
Pierson, C. L		101
Samper & Co., S.		186
Stevens, Corvin & Co		30
Ward, J. E. & Co		737
Total		1,433
Corres. date, 1889		2,866

Steel and Iron Rods.	Tons.	Tons.
Abbott & Co	362	8,419
American S. Co	100	765
Bacon & Co		469
Bunnell & Co., J. H		50
Carey & Moen	35	466
Cooper, Hewitt & Co		371
Dana & Co		803
Dodge & Co., A	3	3
Downing & Co		129
Galpin, S. A		1,206
Greely & Co. E. S		35
Hazard Mfg. Co	51	421
Holt & Co., H. N		3
Jacobus, E. Y		2
Lee, James & Co	128	1,682
Lillienberg, N		300
Lundberg, G		126
Lundell, C. G		5
Milne & Co	142	1,446
Muller, Schall & Co	48	800
Naylor & Co	200	5,557
Page, Newell & Co		1,229
Roebling's Sons, J. A	60	2,437
Schulze & R		1
Taylor, N. L		18
Temple & Lockw'd		6
Wessel & Co		21
Wiebusch & Ho		4
Wood & Niebuhr		25
Wolf & Co., R. H	77	3,122
Total	1,206	29,919
Corres. date, 1889	885	35,937

Old Rails.	Tons.	Tons.
Bowring & Archibald		340
Dana & Co		764
Frankfort, M	591	6,558
Henderson Bros		300
Hernsheim, L		350
Mosle Bros		123
Naylor & Co		1,968
Sawyer, Wallace & Co		610
Wiechers, J. F		150
Total	591	11,163
Corres. date, 1889	428	10,127

Spiegeleisen.	Tons.	Tons.
Abbott, Jere & Co		2,725
American Metal Co		100
Blakely & McLellan		1,684
Crocker Bros	172	20,678
Crooks & Co. R		106
Dana & Co		15,900
Foley, F		50
Geisenheimer & Co.	35	728
Henderson Bros. & Co		14
Hernsheim, L	620	18,452
Holt, H. N		200
Ivin & Co., R. L		50
Naylor & Co	25	10,051
Perkins, C. L		1,452
Sachs & Richmond		2
Whittemore, H. & Co		55
Total	852	72,247
Corres. date, 1889	3,435	59,643

Iron Ore.	Tons.	Tons.
Baiz, Jacob		67
Bowring & Archibald		5,292
Earnshaw, A		3,517
Ennis, Andrew		438
Flores & Co., R. de		14,143
Johnson & Co., L		5,030
Total		28,487
Corres. date, 1889		8,660

EXPORTS.

Copper.	Pounds.	Pounds.
Abbott & Co., Jere		2,545,103
Amer. Met. Co., L		940,3c5
Barber & Co		13,750
Belmont, Aug. & Co		1,763,974
Boker, C. F		117,000
Burgass & Co		227,290
French, Edye & Co		135,374
Heidelbech, Sicheimer & Co		672,608
Lewisohn Bros	113,238	113,238
Muller, Schall & Co		16,250
Sawyer, W'l'ce & Co		22,796
Seamen, S. H		66,950
Ward, J. E. & Co		100,000
Wiechers, J. F		29,977
Wil'ms & T'hune		112,004
Total	113,238	5,881,690
Corre. date, 1889	973,297	8,282,248

Copper Matte.		
American Metal Co		3,072,079
Lewisohn Bros	362,519	2,066,365
Nichols, Geo. H		267,202
Paulsen, Wm		1,039,428
Wil'ms & T'hune		2,848,706
Total	362,519	9 293,780
Corres. date 1889		23,910,388

DIVIDEND-PAYING MINES.

	Name and Location of Company.		Capital Stock.	Shares. No.	Shares. Par	Assessments. Total levied.	Assessments. Date and Amount of last			Dividends. Total paid.	Dividends. Date & amount of last.		
1	Adams, s. L.	Colo.	*$1,500,000	150,000	$10	*				$555,000	Jan.	1887	.10
2	Alice, s. c.	Mont.	10,000,000	400,000	25	*				850,000	July	1890	.06¼
3	Alma&Nei Wood C.,g	Idaho	300,000	30,000	10	*				60,000	Jan.	1889	.50
4	American & Nettie,c.	Colo.		300,000						150,000	Nov.	1889	.10
5	Amy & Silversmith,s.	Mont.		341,419						247,530	Aug.	1887	.12½
6	Atlantic, c.	Mich.	1,000,000	40,000	25	$280,000	April	1875	$1.00	660,000	Aug.	1890	1.00
7	Argenta, s.	Nev.	10,000,000	100,000	100	335,000	July.	1889	.10	40,000	Feb.	1880	.20
8	Aspen Mg. & S., s. L.	Colo.	2,000,000	200,000	10	*				500,000	Sept.	1890	.10
9	Aurora, i.	Mich.	2,000,000	100,000	20					155,000	Oct.	1887	1.87½
10	Badger, s.	Ont.	250,000	50,000	5					37,500	Mar.	1890	.25
11	Bassick, g. s.	Colo.	10,000,000	100,000	100	*				400,000	Mar.	1884	1.00
12	Belle Isle, s.	Nev.	10,000,000	100,000	100	190,000	Dec.	1889	.15	300,000	Dec.	1879	.25
13	Belcher, g. s.	Nev.	10,400,000	104,000	100	2,978,000	June	1890	.50	15,397,000	April	1876	1.00
14	Bellevue, Idaho, s. L.	Idaho	1,250,000	125,000	10	120,000	Dec.	1889	.25	200,000	Jan.	1887	.10
15	Bi-Metallic, s.	Mont.	5,000,000	200,000	25					150,000	Sept.	1890	.25
16	Bodie Con., g. s.	Cal.	10,000,000	100,000	100	575,000	Nov.	1889	.25	1,602,572	April	1885	.50
17	Boston & Mont., g.	Mont.	2,500,000	250,000	10	*				520,000	June	1886	1.15
18	Boston & Mont., c. s.	Mont.	2,500,000	100,000	25	*				1,450,000	Aug.	1890	.50
19	Breece, s.	Colo.	5,000,000	200,000	25	*				2,000	Feb.	1880	.01
20	Brooklyn Lead, L. s.	Utah.	500,000	50,000	10					127,000	July	1887	.05
21	Bulwer, g.	Cal.	10,000,000	100,000	10	130,000	Aug.	1889	.25	175,000	Jan.	1884	.10
22	Bunker Hill & Suil.	Idaho	3,000,000	300,000	10	*				150,000	Oct.	1883	.06⅔
23	Caledonia, g.	Dak.	10,000,000	100,000	100	505,000	May	1885	.15	186,000	Sept.	1890	.08
24	Calliope, s.	Colo.	1,000,000	1,000,000						90,000	April	1890	.01
25	Calumet & Hecla, c.	Mich.	2,500,000	100,000	25	1,200,000				34,350,000	May	1890	5.00
26	Carbonate Hill, s. L.	Colo.	1,500,000	300,000	10	*				90,000	April	1884	.05
27	Carlisle, g.	N. M.	1,000,000	200,000	5					175,000	Dec.	1888	.12½
28	Castle Creek, g.	Idaho	100,000	100,000	1					51,000	Oct.	1883	.08
29	Catalpa, s. L.	Colo.	3,000,000	300,000	10	*				270,000	May	1884	.10
30	Central, c.	Mich.	500,000	20,000	25	100,000	Oct.	1861	.65	1,950,000	Feb.	1890	1.00
31	Chrysolite, s. L.	Colo.	10,000,000	200,000	50	*				1,650,000	Dec.	1884	.25
32	Colorado Central,s.L.	Colo.	2,750,000	275,000	10	*				406,250	Aug.	1889	.05
33	Confidence, s. L.	Nev.		24,960		328,880	May	1890	.75	199,680	April	1889	1.00
34	Cons. Cal. & Va., g. s.	Nev.	21,600,000	216,000	100	108,000	Jan.	1885	.20	3,466,800	April	1890	.25
35	Contention, s.	Ariz.	12,500,000	250,000	50					12,587,500	Dec.	1884	.25
36	**Cop. Queen Con., c.	Ariz.	1,400,000	140,000	10					210,000	Feb.	1889	.50
37	Crescent, s. L. g.	Utah.	15,000,000	600,000	25	*				228,000	Oct.	1888	.03
38	Crown Point, g. s.	Nev.	10,000,000	100,000	100	2,425,000	Sept.	1889	.57	11,580,000	Jan.	1875	2.00
39	Daly, s. L.	Utah.	3,000,000	150,000	20					1,612,500	Aug.	1890	.25
40	Deer Creek, s. g.	Idaho	1,000,000	200,000	5	*				20,000	June	1889	.05
41	Deadwood-Terra, g.	Dak.	5,000,000	200,000	25	*				$1,000,000	Nov.	1887	.10
42	Derbec B. Grav., g. s.	Cal.	10,000,000	100,000	100	90,000	Dec.	1881	.10	210,000	Oct.	1889	.10
43	Dunkin, s. L.	Colo.	5,000,000	200,000	25	*				380,000	Oct.	1889	.05
44	Dunstone, g. s. L.	Mont.	1,000,000	200,000	5	*				6,000	Nov.	1887	.10
45	Eclipse.	Colo.	100,000	100,000	1					20,000	Nov.	1887	.10
46	Elkhorn, g. s.	Mont.	1,000,000	100,000	10	50,000	July.	1883	.50	850,000	July.	1887	.05
47	Empire Lt., g.	Mont.	500,000	100,000	5					70,500	Oct.	1887	.37½
48	Eureka Con., g. s. L.	Nev.	5,000,000	50,000	100	550,000	June	1889	.50	4,892,500	Oct.	1890	.25
49	Evening Star, s. L.	Colo.	500,000	50,000	10	*				1,458,000	Dec.	1889	.35
50	Excelsior, g.	Cal.	10,000,000	100,000	100	560,000	Sept.	1885	1.00	875,000	Oct.	1889	.25
51	Father de Smet, g.	Dak.	10,000,000	100,000	100	300,000	Nov.	1878	1.00	1,125,000	Dec.	1885	.20
52	Franklin, c.	Mich.	1,000,000	40,000	25	220,000	June	1871		960,000	Jan.	1889	2.00
53	Freeland, g. s. c.	Colo.	5,000,000	200,000	25	*				190,000	July.	1886	.10
54	Garfield Lt., g. s.	Nev.	500,000	100,000	5					95,000	April	1888	.12½
55	Gould & Curry, g. s.	Nev.	10,880,000	108,800	100	3,988,800	Sept.	1890	.25	2,826,000	Oct.	1870	10.00
56	Grand Prize, s.	Nev.	10,000,000	100,000	100	785,000	Jan.	1890	.30	525,000	Jan.	1890	.30
57	Granite, s. L.	Idaho	500,000	500,000		*				28,400	Oct.	1889	.02
58	Granite Mountain, s.	Mont.	10,000,000	400,000	25					9,200,000	July.	1890	.50
59	Green Mountain, g.	Cal.	1,250,000	125,000	10	*				212,000	Nov.	1881	.07½
60	Hale & Norcross, g. s.	Nev.	11,200,000	112,000	100	5,142,800	April	1890	.50	1,162,000	July.	1888	.50
61	Hecla Con., s. g. L. c.	Mont.	1,500,000	30,000	50					1,500,000	April	1889	.50
62	Hel'a Mg.& Red,g.s.L.	Mont.	3,315,000	663,000	5	*				197,979	July.	1886	.06
63	Holmes, s.	Nev.	10,000,000	100,000	100	370,000	May	1890	.25	75,000	April	1886	.25
64	Holyoke, g.	Idaho	200,000	200,000	1					27,000	Feb.	1883	.10
65	Homestake, g.	Dak.	12,500,000	125,000	100	300,000	July.	1878	1.00	5,581,250	Aug.	1890	.10
66	Honorine, s. L.	Utah.	500,000	250,000	2	37,500	April	1889	.05	125,000	Sept.	1887	.05
67	Hope, s.	Mont.	1,000,000	100,000	10	*				283,252	April	1888	.25
68	Horn-Silver, s. L.	Utah.	10,000,000	400,000	25	*				4,150,000	June	1890	.12½
69	Hubert, g.	Colo.	1,000,000	1,000,000	1	*				247,000	Dec.	1889	.00½
70	Idaho, g.	Cal.	310,000	3,100	100					5,225,900	Dec.	1889	5.00
71	Ideal, s. L.	Colo.	1,500,000	50,000	10					15,000	Oct.	1886	.05
72	Illinois, s.	N. M.	100,000	100,000	1	*				45,000	April	1889	.20
73	Independence, s.	Nev.	10,000,000	100,000	100	340,000	Oct.	1886	.20	225,000	Sept.	1879	.25
74	Iron Hill, s.	Dak.	2,500,000	250,000	10	134,000	July.	1889	.03	156,250	Nov.	1887	.07½
75	Iron-Silver, s. L.	Colo.	10,000,000	500,000	20	*				2,500,000	April	1889	.20
76	Jackson, s.	Nev.	5,000,000	50,000	100	237,500	Nov.	1888	.20	55,000	June	1889	.10
77	Jay Gould.	Mont.	2,000,000	40,000	5	*				459,000	May	1890	.04
78	Jocuistita, L.	Mex.	2,500,000	250,000	10					1,200,000	Feb.	1885	.50
79	Jumbo, g.	Colo.	2,000,000	200,000	10					35,000	Oct.	1887	.02½
80	Kearsarge, c.	Mich.	1,250,000	50,000	25	190,000	Oct.	1887	1.00	100,000	Jan.	1890	2.00
81	Kentuck.	Nev.	3,000,000	30,000	100	406,930	Aug.	1890	.30	1,350,000	Dec.	1886	.10
82	La Plata, s. L.	Colo.	2,000,000	200,000	10	*				610,000	Nov.	1882	.30
83	Leadville Con., s. L. I.	Colo.	4,000,000	400,000	10	*				4,423,000	April	1889	.05
84	Lexington, g. s.	Mont.	4,000,000	40,000	100	*				609,000	Jan.	1885	2.00
85	Little Chief, s. L.	Colo.	10,000,000	200,000	50	*				810,000	Jan.	1890	.05
86	Little Pittsburg, s. L.	Colo.	20,000,000	200,000	100	*				1,050,000	Mar.	1890	.50
87	Little Rule.	Colo.	500,000	500,000	1					30,000	June	1890	.02
88	Mammoth.	Utah.	10,000,000	400,000	25					480,000	Aug.	1890	.10
89	Martin White, s.	Nev.	10,000,000	100,000	100	1,200,000	Feb.	1890	.25	140,000	Dec.	1886	.25
90	Mary Murphy, g. s.	Colo.	350,000	3,500	100	*				175,000	May	1888	5.00
91	Matchless, s.	Colo.	500,000	500,000	1	*				15,000	Feb.	1890	.00½
92	May Mazeppa.	Colo.	1,000,000	100,000	1					30,000	Sept.	1890	.01
93	Minnesota, c.	Mich.	1,000,000	40,000	25	420,000	April	1886	1.00	1,820,000	Mar.	1876	
94	Mono, g.	Cal.	5,000,000	50,000	100	747,500	Nov.	1889	.25	12,500	Mar.	1886	.25
95	Montana, Lt., g. s.	Mont.	3,300,000	660,000	5	*				3,515,306	Aug.	1890	.06
96	Morning Star, s. L.	Colo.	1,000,000	100,000	10					850,000	Dec.	1889	.20
97	Moulton, s. g.	Mont.	2,000,000	400,000	5	*				380,000	Dec.	1887	.07½
98	Mount Pleasant, g.	Cal.	150,000	150,000	1	*				150,000	Feb.	1887	.30
99	Mt. Diablo, s.	Nev.	5,000,000	50,000	100	137,500	June	1889	2.00	160,000	Oct.	1889	.20
100	Napa, q.	Cal.	700,000	100,000	7					350,000	July.	1890	.10
101	Navajo, g. s.	Nev.	10,000,000	100,000	100	500,000	April	1890	.15	305,000	April	1889	.10
102	New Guston, s.	Colo.	500,000	100,000	5					337,500	April	1890	.50
103	N. Hoover Hill, g. s.	N. C.	300,000	120,000	2½	*				30,000	Dec.	1885	.06¼
104	Northern Belle, s.	Nev.	5,000,000	50,000	100	425,000	Jan.	1884	8.00	2,400,000	April	1883	.50
105	North Belle Isle, s.	Nev.	10,000,000	100,000	100	395,000	April	1890	.20	230,000	May	1888	.50
106	North Star, g.	Cal.	1,000,000	100,000	10					250,000	Nov.	1889	.50
107	Ontario, s. L.	Utah.	15,000,000	150,000	100					11,225,000	Aug.	1890	.10
108	Ophir, g. s.	Nev.	10,000,000	100,000	100	4,210,640	April	1890	.50	1,595,800	July.	1882	1.00
109	Original, s. c.	Mont.	1,500,000	60,000	25	*				123,000	July.	1888	.05
110	Oro.	Colo.	500,000	100,000	5					60,000	June	1890	.30
111	Osceola, c.	Mich.	1,250,000	50,000	25	480,000	April	1876	1.60	1,372,500	Sept.	1890	1.00
112	Oxford, g.	N. S.	125,000	125,000	1	*				28,500	Sept.	1888	.02
113	Paradise Valley, g. s.	Nev.	10,000,000	100,000	100	57,000	April	1888	.15	150,000	April	1887	.10
114	Parrot, c.	Mont.	1,800,000	180,000	10					642,000	June	1890	.03
115	Peacock, s. g. c.	N. M.	2,000,000	200,000	10	*				60,000	Nov.	1886	
116	Plumas Eureka, g.	Cal.	1,406,250	140,625	10					2,548,046	Oct.	1889	.37½
117	Plutus, g. s. c. L.	Colo.	2,000,000	200,000	10	*				20,000	Feb.	1886	.10
118	Plymouth Con., g.	Cal.	5,000,000	100,000	50	*				2,290,000	Feb.	1888	.50
119	Quicksilver, pref., q.	Cal.	4,300,000	43,000	100					1,705,791	Aug.	1890	1.50
120	" com., q.	Cal.	5,700,000	57,000	100					643,867	July.	1882	.40
121	Quincy, c.	Mich.	1,000,000	40,000	25	200,000	Dec.	1862		5,570,000	Aug.	1890	5.00
122	Republic, c.	Mich.	5,000,000	100,000	50	400,000	Dec.	1889	.30	4,312,587	June	1887	1.25
123	Richmond, s. L.	Nev.	1,250,000	54,000	25	*				99,785	Feb.	1890	.50
124	Ridge, c.	Mich.	500,000	32,000	25	219,939	Mar.	1886	.50	595,000	Mar.	1886	.05
125	Robinson Con., s. L.	Colo.	10,000,000	200,000	50	*				100,000	Dec.	1882	.50
126	Robert E. Lee, s. L.	Colo.	10,000,000	500,000	20					4,460,000	July.	1869	3.00
127	Savage, s.	Nev.	11,200,000	112,000	100	6,604,000	Nov.	1889	.50	7,500	April	1883	.01
128	Shoshone, g.	Idaho	150,000	150,000	1					1,568,145	April	1888	.12½
129	Sierra Buttes, g.	Cal.	2,225,000	122,500	10					102,000	Jan.	1871	1.00
130	Sierra Nevada, g. s.	Nev.	10,000,000	100,000	100	6,236,910	May	1890	.50	270,000	April	1890	.10
131	Sierra Nevada, s. L.	Idaho	1,000,000	1,000,000	1	*				40,000	May	1889	.02
132	Silver Cord, g. s. L.	Colo.	4,500,000	450,000	10					270,000	April	1888	.10
133	Silver King, s.	Ariz.	10,000,009	100,000	100	100,000	June	1890	.20	1,950,000	July.	1887	.25
134	Silver Mg. of L. V.	N. M.	500,000	500,000	1					225,000	Sept.	1890	.15
135	Silverton, g. s. L.	Colo.	2,000,000	200,000	10	*				50,000	Jan.	1881	.25
136	Small Hopes Con., s.	Colo.	5,000,000	200,000	25	*				3,137,500	June	1889	.10
137	Spring Valley, g.	Cal.	200,000	200,000	1	50,000	Oct.	1886	.25	3,595,000	June	1888	.05
138	Standard, g. s.	Cal.	10,000,000	100,000	100	100,000	June	1890	.50	155,600	Nov.	1881	.05
139	Stormont, s.	Utah.	500,000	500,000	1	*				844,000	Dec.	1887	.20
140	St. Joseph, L.	Mo.	1,500,000	150,000	10	*				9,000	April	1888	.02½
141	Swansea, g.	Colo.	600,000	60,000	10	*				100,000	Nov.	1881	.20
142	Tamarack, c.	Mich.	1,000,000	40,000	25	520,000	April	1885	3.00	1,020,000	Oct.	1890	4.00
143	Tombstone, g. s. L.	Ariz.	12,500,000	500,000	25	*				1,250,000	April	1882	.10
144	United Verde, c.	Ariz.	3,000,000	300,000	10	*				97,500	Feb.	1884	.10
145	Valencia, m.	N. M.	150,000	1,500	100	*				41,250	April	1886	2.50
146	Viola Lt., s. L.	Idaho	750,000	150,000	5					272,500	Oct.	1887	.37½
147	Ward Con., s. L.	Colo.	2,000,000	200,000	10					20,000	Dec.	1889	.05
148	Yankee Girl.	Colo.	2,500,000	250,000	10					1,275,000	July.	1887	.10
149	Yellow Jacket, g. s.	Nev.	12,000,000	120,000	100	5,508,000	Mar.	1889	.50	2,148,000	Aug.	1871	1.50
150	Webb City, L. Z.	Mo.	55,000	11,000	5					4,400	July.	1889	.10
151	Woodside.	Utah.								25,000	Oct.	1889	.25
152	Young America.	Cal.								175,000		1889	.10

NON-DIVIDEND PAYING MINES.

	Name and Location of Company.		Capital Stock.	Shares. No.	Shares. Par	Assessments. Total levied.	Assessments. Date and am't of last.		
1	Agassiz Cons., s. L.	Colo.	$2,500,000	50,000	$50	*			
2	Allegheny, s.	Colo.	5,000,000	500,000	10				
3	Allouez, c.	Mich.	2,000,000	80,000	25	$737,000	Jan.	1890	.70
4	Alpha Con., g. s.	Nev.	3,000,000	30,000	100	112,500	Sept.	1890	.25
5	Alta, s.	Nev.	10,080,000	100,800	100	3,359,800	Sept.	1888	.50
6	Amador, g.	Cal.	400,000	200,000	2	*			
7	American Flag, s.	Colo.	1,250,000	125,000	10	800,000	June	1887	
8	Amity, s.	Colo.	250,000	250,000	1				
9	Anglo-Montana, Lt.	Mont.	600,000	120,000	5				
10	Astoria, g.	Cal.	200,000	100,000	2				
11	Barcelona, g.	Nev.	5,000,000	200,000	25	*			
12	Bechtel Con., g.	Cal.	10,000,000	100,000	100	178,500	Jan.	1883	.10
13	Belmont, s.	Nev.	5,000,000	50,000	100	735,000	April	1886	.10
14	Best & Belcher, g. s.	Nev.	10,080,000	100,800	100	2,279,275	Aug.	1890	.25
15	Big Pittsburg, s. L.	Colo.	20,000,000	200,000	100	*			
16	Black Oak, g.	Cal.	3,000,000	300,000	10	*			
17	Boston Con., g.	Cal.	10,000,000	100,000	100	170,000	Nov.	1883	.25
18	Bremen, s.	N. M.	5,000,000	500,000	10	*			
19	Brennlow, s.	Colo.	250,000	250,000	1				
20	Brunswick, g.	Cal.	2,000,000	400,000	5	*			
21	Bullion, g. s.	Nev.	10,000,000	100,000	100	2,790,000	Dec.	1889	.25
22	Calaveras, g.	Cal.	500,000	500,000	1	*			
23	Carisa, g.	Wy.	500,000	100,000	5	*			
24	Carupano, g. s. L. c.	Ven.	200,000	100,000	2	*			
25	Caribou, g. s.	Colo.	500,000	250,000	2	*			
26	Charles Dickens, g. s.	Idaho	1,250,000	250,000	5	*			
27	Cherokee, g.	Cal.	1,500,000	150,000	10				
28	Chollar, s.	Nev.	11,200,000	112,000	100	1,540,000	Nov.	1889	.50
29	Cleveland, t.	Dak.	1,000,000	500,000	2	*			
30	Colchis.	N. M.	500,000	50,000	10				
31	Commonwealth, s.	Nev.	10,000,000	100,000	100	170,000	Nov.	1888	.50
32	Comstock, g. s.	Nev.	10,000,000	100,000	100	35,000	Mar.	1887	.15
33	Con. Imperial, g. s.	Nev.	5,000,000	50,000	100	1,875,000	July.	1890	.05
34	Con. Pacific, g.	Cal.	6,000,000	60,000	100	198,000	June	1890	.10
35	Con. Silver, s.	Mo.	2,500,000	250,000	10				
36	Crescent, s. L.	Colo.	3,000,000	300,000	10	*			
37	Crocker, s.	Ariz.	10,000,000	100,000	100	150,000	June	1890	.15
38	Crowell, g.	N. C.	500,000	500,000	1				
39	Dahlonega, g.	Ga.	250,000	250,000	1	*			
40	Dandy, s.	Colo.	5,000,000	500,000	10	*			
41	Decatur, s.	Colo.	1,500,000	300,000	5	*			
42	Denver City, s. L.	Colo.	5,000,000	500,000	10	*			
43	Denver Gold, g.	Colo.	300,000	60,000	5				
44	Durango, g.	Colo.	500,000	500,000	1	*			
45	Eastern Dev. Co., Lt.	N. S.	1,500,000	150,000	10	990,000	Mar.	1886	1.00
46	El Cristo, g. s.	U.S.C.	1,000,000	500,000	2				
47	El Dorado, g.	Cal.	1,000,000	250,000	4	*			
48	El Talento, g.	U.S.C.	1,000,000	500,000	2				
49	Empire, s.	Utah.	10,000,000	100,000	100				
50	Eureka Tunnel, s. L.	Nev.	10,000,000	100,000	100	*			
51	Exchequer.	Nev.	10,000,000	100,000	100	865,000	July.	1890	.25
52	Found Treasure, g. s.	Nev.	10,000,000	100,000	100	81,500	May	1890	.25
53	Gogebic I. Syn., i.	Wis.	5,600,000	200,000	25				
54	Gold Cup, s.	Colo.	500,000	500,000	1	*			
55	Golden Era, s.	Mont.	2,000,000	200,000	10	*			
56	Golden Placer, g.	Colo.	5,000,000	200,000	25	229,314	Dec.	1885	.25
57	Gold Rock, g.	Cal.	1,000,000	500,000	2	*			
58	Goodshaw, g.	Cal.	10,000,000	100,000	100	*			
59	Grand Belt, c.	Tex.	12,000,000	120,000	100				
60	Grand Duke.	Colo.	800,000	80,000	10				
61	Great Remance, g.	U.S.C.	1,000,000	500,000	2	*			
62	Gregory-Bobtail, g.	Colo.	550,000	550,000	1	*			
63	Gregory Con., g.	Mont.	3,000,000	300,000	10				
64	Harlem M. & M. Co., g.	Cal.	1,000,000	200,000	5				
65	Head Cent. & Tr., s. g.	Ariz.	10,000,000	100,000	100				
66	Hector, g.	Cal.	1,500,000	300,000	5	45,000	Jan.	1889	.15
67	Highland, c.	Mich.	500,000	25,000	20				
68	Hollywood.	Cal.	200,000	100,000	2				
69	Hortenese, s.	Colo.	2,000,000	200,000	10				
70	Huron, c.	Mich.	1,000,000	40,000	25	280,000	May.	1887	3.00
71	Iron, Gold & Silver, s.	N. M.	2,000,000	200,000	10				
72	Ironton, i.	Wis.	1,000,000	40,000	25				
73	Iroquois, c.	Mich.	1,250,000	50,000	25				
74	J. D. Reymert.	Ariz.	10,000,000	100,000	100				
75	Julia Con., g. s.	Nev.	11,000,000	110,000	100	1,463,000	Jan.	1889	.10
76	Lacrosse, g.	Colo.	1,000,000	100,000	10	*			
77	Lee Basin, s. L.	Colo.	5,000,000	500,000	10	*			
78	Mayflower Gravel.	Cal.	1,000,000	100,000	10	585,000	Mar.	1890	.56
79	Medora, g.	Dak.	250,000	250,000	1				
80	Mexican, g. s.	Nev.	10,000,000	100,000	100	2,766,960	May.	1890	.25
81	Middle Bar, g.	Cal.	400,000	200,000	2	*			
82	Mike & Starr, s. L.	Colo.	1,000,000	300,000	5	*			
83	Mollie Gibson.	Colo.	2,000,000	100,000	2	*			
84	Monitor, g.	Colo.	100,000	1,000,000	1	*			
85	Mutual Mg. & Sm.	W'sh.	100,000	100,000	1	*			
86	Native, c.	Mich.	1,000,000	40,000	25				
87	Neath, g.	Colo.	1,000,000	100,000	10				
88	Nevada Queen, s.	Nev.	10,000,000	100,000	100	300,000	Oct.	1889	.25
89	New Germany, g.	N. S.	100,000	100,000	1	*			
90	New Pittsburg, s. L.	Colo.	2,000,000	200,000	10	*			
91	N. Commonw'h, s.	Nev.	10,000,000	100,000	100	85,000	April	1890	.25
92	North Standard, g.	Cal.	10,000,000	100,000	100	20,000	Nov.		
93	Noonday.	Cal.	600,000	60,000	10	208,000	Dec.	1881	.10
94	Oneida Chief, g.	Cal.	500,000	125,000	100	*			
95	Oriental & Miller, s.	Nev.	10,000,000	400,000	25				
96	Osceola, g.	Nev.	5,000,000	500,000	10	*			
97	Overman, g. s.	Nev.	11,520,000	115,200	100	3,832,800	Dec.	1889	.25
98	Park, s.	Utah.	2,000,000	200,000	10	*			
99	Peer, s.	Ariz.	10,000,000	100,000	100	165,000	Aug.	1890	.10
100	Peerless, s.	Ariz.	10,000,000	100,000	100	405,000	Aug.	1890	.15
101	Phœnix.	Ariz.	500,000	500,000	1	*			
102	Phœnix, g. s.	Ark.	5,000,000	200,000	25	*			
103	Phœnix Lead, s. L.	Colo.	10,000,000	100,000	1	*			
104	Pilgrim, g.	Cal.	600,000	300,000	2	*			
105	Potosi, s.	Nev.	11,200,000	112,000	100	1,573,000	Mar.	1890	.50
106	Prousdite, s.	Idaho	250,000	250,000	1	*			
107	Puritan, s. g.	Colo.	1,500,000	150,000	10	*			
108	Quincy.	Colo.	3,000,000	300,000	10	*			
109	Rappahannock, g. s.	Va.	250,000	250,000	1	*			
110	Red Elephant, s.	Colo.	500,000	500,000	1	*			
111	Ropes, g. s.	Mich.	2,000,000	80,000	25	147,200	July.	1887	.50
112	Russell, g.	Nev.	1,500,000	300,000	5	*			
113	Sampson, g. s. L.	Utah.	10,000,000	100,000	100	288,157

NEW YORK MINING STOCKS QUOTATIONS.

DIVIDEND-PAYING MINES.

NAME AND LOCATION OF COMPANY.	Sept. 20.		Sept. 22.		Sept. 23.		Sept. 24.		Sept. 25.		Sept. 26.		SALES.
	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Alice													
Argenta, Mich													
Belcher, Nev													
Belle Isle													
Bodie Cons., Cal									1.75	1.65	1.50		240
Bos. & Mont., Mont													
Breece, Colo													
Bulwer, Cal													
Caledonia													500
Catalpa, Colo			.40		.40								550
Chrysolite						.35			.35				500
Colorado Central													
Confidence, Nev													
Cons. Cal. & Va., Nev									4.85		4.75		60
Crown Point, Nev	3.10								3.00		3.05		300
Deadwood, Dak													
Dunkin, Colo													
Eureka Con													
Father de Smet, Dak													
Franklin													
Freeland, Colo	.36		.36		.36				.37				3,400
Gould & Curry, Nev	2.25				2.35				2.35		2.45		500
Hale & Norcross, Nev	2.50												100
Holyoke													
Homestake, Dak					10.75		11.75	11.00					336
Horn-Silver, Utah			3.65	3.60	3.37		3.50		3.50	3.40	3.50		1,605
Independence, Nev													
Iron Hill, Dak											.55		200
Kearsarge													
Leadville C., Colo	.15		.15		.16	.15	.16		.15				21,700
Little Chief, Colo	.42		.42										200
Mono, Cal									.75				200
Moulton, Mont	.60		.60										800
Navajo, Nev													
N. Belle Isle, Nev									1.10				100
Ontario, Utah					45.50				47.25		45.30		300
Ophir, Nev	5.00				5.25		5.25		5.38				400
Osceola, Mich													
Plymouth, Cal					3.25	3.00			3.00				610
Quicksilver, Pref													
" Com													
Quincy, Mich													
Robinson Cons., Colo													
Savage	3.75						3.85						200
Sierra Nevada, Nev	3.00												100
Silver Cord													
Silver King, Ariz									.20				10
Silver Mg. of L. V	.82								.82				410
Small Hopes													
Standard											1.50		300
Stormont, Utah							.07						400
Tamarack, Mich													
Yellow Jacket, Nev	3.50		3.65								3.55		400

NON-DIVIDEND-PAYING MINES.

NAME AND LOCATION OF COMPANY.	Sept. 20.		Sept. 22.		Sept. 23.		Sept. 24.		Sept. 25.		Sept. 26.		SALES.
	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Alpha, Nev													
Alta, Nev	1.25				1.30		1.25		1.25		1.25		500
American Flag, Colo							.05						100
Andes, Nev													
Amador, Cal													
Astoria, Cal	.05								.06	.05			2,000
Barcelona, Nev							.11						100
Best & Belcher, Nev					3.75		3.80				3.85		300
Bonanza King, Cal													
Brunswick, Cal	.13	.12	.12		.10		.10		.10	.08	.09	.07	11,000
Bullion, Nev													
Butte & Bost., Mont													
Castle Creek, Idaho													
Chollar, Nev	3.40				3.55				3.50				300
Col. & Beaver, Idaho													
Commonwealth, Nev													
Comstock T., Nev													
" bonds							.25						2,000
" scrip													
Con. Imperial, Nev													
Crescent, Colo			.17		.17								550
Denver City, Colo			.10										100
El Cristo, Rep. of Col			.75		.80		.85	.82	.85				1,500
Exchequer													
Hollywood, Cal													
Huron, Mich													
Julia, Nev	.45		.40		.41				.41		.40		1,500
Kingston & Pembroke			.50		.50								300
Kossuth													
Lacrosse, Colo	.08		.08		.08								3,200
Lee Basin, Colo													
Mexican, Nev	3.25						3.40				3.60		300
Minn. Iron Co., Mich													
Monitor													
Mutual Sm. & Mg. Co	1.45		1.40		1.45		1.45		1.45		1.45		1,700
Nevada Queen, Nev	1.00				1.00								200
N. Commonwealth, Nev													
Occidental, Nev			2.25	2.10	2.10								400
Oriental & Mil., Nev													
Overman, Nev													
Phœnix of Ariz	1.10		1.10		1.05	1.00	1.05		1.05	.98	1.00	.90	4,300
Phœnix Lead, Colo													
Potosi	7.88				7.75				7.13				300
Rappahannock, Va	.07	.06											1,000
Santiago, U. S. C													
S. Sebastian	.47		.47		.48								600
Scorpion													
Shoshone													
Silver Hill													
Silver Queen													
Sullivan Con., Dak			.99										100
Sutro Tunnel, Nev													
Sutter Creek, Cal	1.40		1.40		1.40		1.35		1.35		1.30		1,100
Union Cons., Nev							.0						
Utah, Nev	1.30				1.25		1.25		1.30		1.30		950

*Ex. dividend. †Dealt in at the New York Stock Ex. Unlisted securities. ‡Assessment paid. §Assessment unpaid. Dividend shares sold, 34,421 Non-dividend shares sold, 34,400. Total New York, 68,821.

BOSTON MINING STOCK QUOTATIONS.

NAME OF COMPANY.	Sept. 19.		Sept. 20.		Sept. 22.		Sept. 23.		Sept. 24.		Sept. 25.		SALES.
Atlantic, Mich					25.00	24.50	24.75	24.50			23.50	23.00	505
Bodie, Cal													
Bonanza Development	.80	.58			.75		.65		.70				1,050
Bost. & Mont., Mont	58.50	58.38	59.00	58.50	59.00	58.50	59.25	59.00	59.00	58.00	58.50	57.75	1,102
Breece, Colo					.46		.45				.45		650
Calumet & Hecla, Mich	310	308			310	308	309	307	308	305			86
Catalpa, Colo	.38						.39	.38	.35				1,100
Central, Mich			24.00										50
Chrysolite, Colo							.40		.30				200
Con. Cal. & Va., Nev													
Dunkin, Colo	.55	.53					.63	.58	.63	.60	.60		1,100
Eureka, Nev													
Franklin, Mich					24.00	23.75	23.75	22.50	22.25	22.00	22.00	21.50	1,910
Honorine, Utah													
Horn Silver, Utah									3.55				50
Kearsarge	19.13	19.00	19.50		20.00	19.25	19.00	18.50	18.50		19.50	18.50	1,300
Little Chief, Colo	.43				.47		.45		.45				900
Little Pittsburg, Colo													
Moulton													
Napa, Cal													
Ontario, Utah													
Osceola, Mich			45.00		46.25	45.00	46.00	45.75	45.25		45.50	45.00	1,313
Pewabic, Mich					14.00								70
Quincy, Mich			126		125		125				125		170
Ridge, Mich	1.25	1.00					1.00						700
Sierra Nevada, Nev													
Silver King													
Stormont, Utah													
Tamarack, Mich	306		306		306	304					305		57

NAME OF COMPANY.	Sept. 19.		Sept. 20.		Sept. 22.		Sept. 23.		Sept. 24.		Sept. 25.		SALES.
Allouez, Mich	8.75		8.50		8.50	7.25	7.63	7.25	8.00	7.82	7.82	7.38	3,900
Arnold, Mich					1.63		1.50				1.50		350
Aztec, Mich													
Brunswick, Cal							.11						200
Butte & Boston, Mont	21.50	20.00	20.25		21.00	20.25	21.00	20.13	20.13	19.88	19.50	19.00	2,100
Centennial, Mich	29.00	27.00	29.00		28.00	27.00	27.00		27.00	26.25	26.25	26.00	2,100
Comstock, T., Nev													
Copper Falls Mg													
Crescent, Colo	.16				.16		.16	.12	.15				2,800
Dana, Mich	.38				.35								300
Don Enrique, N. M													
El Cristo, S. A													
Hanover, Mich	.33												100
Humboldt, Mich	.60	.58			.58		.58		.58				1,100
Hungarian, Mich													
Huron, Mich	6.50	6.25			6.38	5.75	6.13		6.00	5.75	5.63	5.50	975
Mesnard, Mich													
National, Mich	2.13				2.50	2.25	2.25				2.00		500
Native, Mich	.23	.20			.10		.20		.30				1,100
Oriental & M., Nev													
Phœnix													
Pontiac									.38				200
Rappahannock, Va													
Santa Fe, N. Mex			.65	.60	.63		.63	.55	.62	.60	.60		3,925
Shoshone, Idaho													
South Side, Mich									.25				200
Star													150
Washington, Mich	.35	.33			.33		.33						900
Winthrop, Mich													

Boston: Dividend shares sold, 12,313. Non-dividend shares sold, 20,950. Total Boston, 33,263.

COAL STOCKS.

NAME OF COMPANY.	Par val. of shares.	Sept. 20.		Sept. 22.		Sept. 23.		Sept. 24.		Sept. 25.		Sept 26.		Sales.
		H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
American Coal														
Cambria Iron														
Cameron Coal & I. Co														
Ches. & O. RR	100													
Chic. & Ind. Coal RR	100													
Do. pref	100													
Col. C. & I.	100	47	46¼	46⅛	45⅛	45¾	45⅛	47	46	47	46	46⅝	46¼	3,400
Col. & Hocking C. I.	100	26¾		26⅝	26	26⅛	26¼	26¾	26⅛	27	26½	26		2,200
Consolidation Coal	100													
Del. & H. C.	100	158¼	158	157	156⅜	157⅛	156⅜	158¼	158	157¾	157¼	157½		1,193
D., L. & W. RR	50	144⅛	143½	144¼	143½	145⅝	143⅛	145¾	144¾	145⅝	144⅜	143⅜	144¼	78,418
Hocking Valley	100	31⅝	31½	32	31¼	32	31¼	31¾	31⅛	31½	31⅛	31		10,400
Hunt. & Broad Top		22¼				22⅛				22⅛	22¾			707
Do. pref		46¾		47	46¾	47		46⅞		47¼	47			1,037
Illinois C. & Coke Co														
Lehigh C. & N	50	52¼	52⅛			5.3⅛	52¼	52½		52½				195
Lehigh Valley RR	50	51¾		52⅛	52	52⅛	52	52⅛	52	52⅛	52			1,130
Lehigh & Wilk. Coal	100													
Mahoning Coal	100													
Marshall Con. Coal	100													
Maryland Coal														
Morris & Essex	100			151										12
New Central Coal	50													
N. J. C. RR	100			118½	118	119	117¾	119		119	118	118½	118	1,320
N. Y. & S. Coal	100													
N. Y., Susq. & West	100					7½	7							630
Do. pref	100	29¼	29	29		28½	28⅛							810
N.Y. & Perry C. & I	100													
Norfolk & West. RR.	50			19⅝		19		19		19				800
Do. pref	50	62¾		61½	61¼			61⅝	61					770
Penn. Coal	50			300				295				301		113
Penn. RR	50	53	52⅞	53	52⅞	52⅞	52⅝	52¾	52⅝	52¾	52⅝			1,999
Ph. & R. RR		41¾	41⅝	41⅝	41	41¼	41	41¾	41¼	41⅝	41	41¼	40½	**38,241
Sunday Creek Coal														
Do. pref	100													
Tennessee C. & I. Co		46	45¾	45	43	43		44	43	43¾	43	43	42	4,400
Do. pref				99		95								119
Westmoreland Coal														

**Sales in New York, 16,316; in Philadelphia, 21,925. Total sales, 147,835.

San Francisco Mining Stock Quotations.

COMPANY.	CLOSING QUOTATIONS.					
	Sept. 19.	Sept. 20.	Sept. 22.	Sept. 23.	Sept. 24.	Sept. 25.
Alpha						
Alta	1.20	1.25	1.20	1.20	1.15	1.15
Belcher						
Belle Isle	1.15	1.15	1.10	1.10	1.00	1.00
Best & Bel	3.25	3.45	3.70	3.70	3.75	3.80
Bodie	1.20	1.20	1.25	1.40	1.70	1.60
Bulwer	.25	.25	.25	.25	.35	.30
Challar	3.35	3.35	3.45	3.35	3.35	3.35
Com'wealth	2.70	2.75	2.50	2.75	2.50	
Con. C. & V	4.75	4.90	4.75	4.75	4.80	4.85
Con. Pac						
Crown Point	3.00	2.95	3.00	2.95	2.90	2.95
Eureka C			4.25	4.25	4.25	4.25
Gould & C	2.15	2.25	2.25	2.20	2.25	2.35
Grand Prize						
Hale & N	2.40	2.40	2.40	2.40	2.45	2.40
M. White						
Mexican	3.15	3.25	3.25	3.25	3.30	3.50
Mono	.45	.50	.50	.60	.65	.60
Mt. Diablo		3.25	3.25		3.25	
Navajo	.40	.40	.40	.40	.35	.35
Nev. Queen	.90	.90	.90	.85	.85	.85
N. Belle Isle	1.15	1.20	1.10	1.10	1.00	1.05
Occidental						
Ophir	4.85	5.25	5.13	5.00	5.13	5.13
Potosi	7.00	7.13	7.13	6.88	7.00	7.00
Savage	3.60	3.70	3.80	3.75	3.90	3.80
Sierra Nev	2.90	3.00	3.00	2.90	2.95	3.05
Union Con			3.00	3.25	2.95	3.05
Utah	1.20	1.20	1.15	1.15	1.20	1.25
Yellow Jak	3.45	3.40	3.45	3.50	3.45	3.50

STOCK MARKET QUOTATIONS.

Baltimore, Md.

COMPANY.	Bid. L. H.	Asked. L. H.
Atlantic Coal	....	....
Balt. & N. C.	.03	....
Big Vein Coal	....	....
Conrad Hill	....	.10
Cons. Coal	.26	.27@.28
Diamond Tunnel	....	....
George's Crk. C.	....	....
Lake Chrome	....	....
Maryland & Charlotte	....	....
North State	.10	....
Silver Valley	.45@.50	.65

Prices bid and asked, lowest and highest, during the week ending Sept. 25.

Birmingham, Ala.

COMPANY.	Bid. L. H.	Asked. L. H.
Ala. Coal & I. Co.	....	$100
Ala. Conn. C. & C. Co.	....	$23
Ala. R. Mill Co.	$80	....
*Alice Furnace	$103	....
Anna Howe G. Mg. Co.	$⅜	$⅞
Bess'mer Land.	....	$35
Bir. Mg. & Mg.	....	$65
Cahaba Coal Mg. Co.	....	$70
Camille Gold Mg. Co.	$½	....
De Bardeleben C. & I. Co.	....	$76
Decat. L. Imp.	....	$13¾
DecaturMin. L.	$15	$19
Ensley Land	$9½	$10¼
*Eureka	**$99	$102½
Florence L. & Mg. Co.	$19	$20½
Gadsen Land	$1⅝@$1¾	$5@$ 1⅛
Hecla Coal Co.	$10	....
Hen. S. & M. Co	$60	$72½@$73
Jagger-Townl'y C. & C. Co.	$8½	$10
Mag-Ellen	$100	....
Mary Lee C. & R. Co.	$20	....
Sheffield C. & I. Co.	$50	$55
Sloss I. & S.	$92	$40
†Sloss I. & S.	$92	$93
††Sloss I. & S.	....	$63
Tuscaloose C. I. & L. Co.	$22	$23
Tenn. C. & I. Co.	$45½	$46¼
" pref.	$100	$105
Vulcan C. & C. Co.	$5	....
Woodstock I. Co.	....	$30@$33

Prices, highest and lowest, bid and asked during week ending Sept. 22.

* Bonds. † First mortgage. †† Second mortgage. ** Without interest.

Pittsburg, Pa. Sept. 24.

COMPANY.	B.	A.	Closing
Allegheny Gas Co.	$38.00	....	$38.00
Bridgewater Gas Co.	54.00	$55.00	55.00
Chartiers Val. Gas	35.00	40.00	33.00
Columbia Oil Co.	2.75	3.25	3.13
Consolidated Gas Co.	....	....	....
East End E. Light Co.	....	....	....
East End Gas Co.	....	....	....
Forest Oil	....	....	....
Hazlewood Oil Co.	50.50	52.00	51.25
La Noria Mining	.17	.19	.17
Luster Mg. Co.	20.00	24.13	21.75
Mansfield C. & C. Co.	....	....	....
Manuf'turers Gas Co.	....	....	....
Nat. Gas Co. of W. Va	....	....	....
N. Y. & Clev. Gas Coal	35.00	36.00	36.00
Ohio Valley Gas	16.00	....	16.00
Pennsylvania Gas	....	14.25	14.25
People's Natural Gas	....	....	....
People's N. G. & P. Co.	15.00	16.00	15.75
Philadelphia Co.	29.38	30.00	29.75
Pine Run Gas Co.	....	....	....
Pittsburg Gas	....	....	....
Silverton Mg. Co.	1.50	....	1.50
South Side Gas	....	....	....
Tuna Oil Co.	....	67.00	67.00
Union Gas	....	....	....
Washington Oil Co.	....	....	....
W'house Brake Co.	73.00	75.00	74.00
W'house A. B. Co.	113.00	114.25	113.50
W'house E. Light.	34.50	36.50	35.25
W'moreland & Camb.	....	16.00	16.00
Wheeling Gas	18.00	20.25	19.50
Yankee Girl Mg	3.00@3.50		3.50

* Actual selling price.

Prices bid and asked and sales during week ending Sept. 24:

Bridgewater Gas	100 shs.	@$50
Luster Mining	375 "	$21¼@ 23¼
N. Y. & Clev. Gas Coal	140 "	$35 @ $35½
Philadelphia Gas Co.	333 "	$29½@$30
West. Air Brake	50 "	@$113
West. Brake Co.	50 "	@$74
West. Electric	225 "	$35@$35⅝

St. Louis. Sept. 24.

CLOSING PRICES.

COMPANY.	Bid.	Asked.
Adams, Colo.	$1.97½	$2.12½
American & Nettie	1.15	1.22½
Aztec, N. Mex.	.08	....
Bi-Metallic	....	....
Central Silver	.17½	.18
Cleveland, Colo.	.04½	.05¾
Cleveland & An'r.	.07½	.11
Cour d'Alene	.95	1.02½
Elizabeth	....	....
Gold King	.04½	.05½
Granite Mountain, Mont.	....	....
Hope	....	....
I. X. L. Colo.	.01½	.03
La Union	.08	.08½
Little Albert	.33¾	.37½
Montrose Placer, Colo.	.60	.63¾
Major Budd, Mont.	.08	.10
Mexican Imp.	.10	.14
Mickey Breen	1.60	1.63
Mountain Key	.50	.55
Nellie	....	.60
Pat Murphy, Colo.	.14½	.16¼
Puzzle	....	....
Richmond Hill	....	.45
Samoa	....	....
Silver Age, Colo.	2.05	....
Small Hopes, Colo.	.90	1.00
Tourtelotte	.03	.04
West Granite, Mont.	.95	1.00
Wire Patch	.15	.16¼
Yuma, Ariz.	.46¼	.47½

Trust Stocks. Sept. 26.

The following closing quotations are reported to-day by C. I. Hudson & Co., members of New York Stock Exchange:

CERTIFICATES.

Am. Cotton Oil. Tr. Repts.	$21¾@	$21½
Cattle Trust	.....@	....
Distillers' & Cattle Feeders'	.....@	....
Linseed Oil	47 @	48½
National Lead	20¼@	20⅝
Standard Oil	165 @	167
Sugar Refineries	77¾@	77⅞

Sales at the New York Stock Exchange week ending Sept. 26:

	Sales.	Price H.	Price L.
*American Cotton Oil	7,525	25	20¾
National Lead	20,200	21⅝	20½
Sugar	226,395	82	76¾

* Trust receipts.

Foreign Quotations.

London. Sept. 13.

COMPANY.	Highest.	Lowest.
Almada, Mex.	2s.	1s. 6d.
Amador, Cal.	£⅞	£¾
Appalachian, N. C.	1s.	6d.
Canadian Phos. Canada.	£½	£¼
Carlisle, N. Mex.	3s. 6d.	3s.
Colorado, Colo.	4s. 6d.	3s. 6d.
Comstock, Utah	....	....
Cordova	....	....
Cons. Esmeralda, Nev.	3s. 9d.	3s. 3d.
Denver Gold, Colo.	6d.	....
Dickens Custer, Idaho.	2s. 3d.	1s. 9d.
East Arevalo, Idaho.	2s.	1s.
El Callao, Venezuela	£2½	£2¼
Elmore, Idaho	2s. 3d.	1s. 9d.
Empire, Mont	1s. 3d.	9d.
Garfield, Nev.	1s 6d.	6d.
Jay Hawk Mont	1s. 6d.	1s.
Josephine, Cal	1s. 6d.	6d.
Kohinoor, Colo.	2s. 3d.	1s. 9d.
La Luz, Mex.	1s. 9d.	1s. 3d.
La Valera, Mex.	2s.	20s.
Montana Lt., Mont	21s. 6d.	20s. 3d.
New California, Colo.	6s. 9d.	6s. 3d.
New Consolidated	9d.	3d.
New Eberhardt, Nev.	1s. 6d.	1s.
New Emma, S., Utah	5s. 3d.	4s. 9d.
New Flagstaff, Utah	....	....
Newfoundland, N. F.	3s. 6d.	3s.
N. Gold Hill, N. C.	1s 3d.	9d.
New Guston, Colo.	£4½	£4
New Hoover Hill, N. C.	1s. 3d.	9d.
Old Lout, Colo.	£⅝	£⅜
Palmarejo, Mex	18s.	17s.
Pinos Altos, Mex	15s.	14s.
Pittsburg Cons., Nev.	8s.	7s.
Richmond Con. Nev.	£1¼	£1
Ruby & Dunderberg, Nev	1s. 6d.	1s.
Sam Christan, N. C.	1s.	6d.
Sierra Buttes Cal.	7s. 6d.	5s.
" Plumas Eur., Cal.	£13-16	£11-16
Sonora Mex	1s.	6d.
United Mexican, Mex.	8s. 6d.	7s. 6d.
U. S. Placer, Colo.	1s. 3d.	9d.
Viola Lt., Idaho	2s. 3d.	1s. 9d.

Highest and lowest prices during the week ending Sept. 13.

Paris. Sept. 11.

	Francs.
Belmez, Spain	735.00
Callao, Venez.	62.50
Callao Bis, Venez.	6.50
East Oregon, Ore.	7.75
Forest Hill Divide, Cal.	100.00
Golden River, Cal	350.50
" " parts	30.00
Lexington, Mont.	121.25
" parts	3.75
Rio Tinto, Spain	595.00
Tharsis, Spain	150.00

CURRENT PRICES.

These quotations are for wholesale lots in New York.

CHEMICALS AND MINERALS.

Acid—Acetic, ℔ 100 lbs. $1.75@$2.00
Muriatic, 18°, ℔ 100 lbs. 1.00@1.50
Muriatic, 20° ℔ 100 lbs. 1.12½@1.75
Muriatic, 22° ℔ 100 lbs. 1.37½@2.00
Nitric, 36°, ℔ 100 lbs. 4.00@4.29
Nitric, 42°, ℔ 100 lbs. 6.00@6.25
Oxalic, ℔ 100 lbs. .6.50@10.50
Sulphuric, 60°, ℔ 100 lbs. 80@1.25
Sulphuric, 66°, ℔ 100 lbs. 1.00@1.75

Alkali—
Refined, 48 p. c. @2¾
Refined, 58°. 2¾@3
Alum—Lump, ℔ lb. 1¾
Ground, ℔ lb. 1¾@2
Lump ℔ ton, Liverpool £4 17 6
Sulphate of Alumina, ℔ ton £4 10
Aqua Ammonia—18°, ℔ lb. 4¾
20°, ℔ lb. 6
22°, ℔ lb. 6@7
26°, ℔ lb. 10@11
Ammonia—Sul., ℔ 100 lbs. 3.15
Carb., per lb. 7½@8½
Arsenic—White, powdered, ℔ lb. 3¼@3½
Red, ℔ lb. 5¾@6¾
White, at Plymouth, ℔ ton. £12 2 6d.
Asbestos—Am., p. ton $50@$300
Italian, p. ton, c. i. f. L'pool £18@£80
Asphaltum—P. ton 13.00
Prime Cuban, ℔ lb. 4½@5½c
Hard Cuban, ℔ ton $28.00
Trinidad, refined, ℔ ton $30.00
Barytes—Sulph., Am. prime white 17@20
Sulph., foreign, floated, p. ton 19½@21.50
Sulph., off color, p. ton 11.50@14.00
Carb., lump, f.o.b. L'pool, ton £6
No. 1, casks, Runcorn " £4 10 0
No 2, bags, Runcorn " 3 15 0
Bleach—Over 35 p.c., ℔ lb. 2@2½
Borax—Refined, ℔ lb. 9½@9⅝
Concentrated 7¾@8⅝
Refined at Liverpool, ℔ ton £29
Brimstone—*See Sulphur.*
Bromine—℔ lb. 37@38
Chalk—℔ ton 1.75
Precipitated, ℔ lb. 4¾@5
China Clay—English, ℔ ton 13.50@18.50
Southern, ℔ ton 13.50
Chrome Yellow—℔ lb. 10@2
Cobalt—Oxide, ℔ lb. 2.60@2.90
Copper—Sulph. English Wks, ton £20@£21
Copperas—Common, ℔ 100 lbs. 70
Best, ℔ 100 lbs. 75@1.00
Liverpool, ℔ ton, in casks £1 15s.
Cream of Tartar—Am. 99½ 22½
Powdered, 99 p. c. 23
Emery—Grain, ℔ lb. 4½@5
Flour, ℔ lb 2¾@3½
Feldspar—Ground, ℔ ton 15.00
Fuller's Earth—Lump, ℔ bbl. .90@95
Powdered, ℔ lb. 1¾@2
Gypsum—Calcined, ℔ bbl. 1.25@1.50
Iodine—Resublimed 2.75
Kainit—℔ ton $9.25@$9.75
Kaolin—*See China Clay.*
Lead—Red, ℔ lb. 6¾@9
White, American, in oil, ℔ lb. 6¾@7¼
White, English, ℔ lb 8½@8¾
Acetate, or sugar of, white 12@13
Lime Acetate—Amer. Brown .95@1.00
" Gray 1.75@1.87½
Litharge—Powdered, ℔ lb. 6½@6¾
English flake, ℔ lb. 9@9½
Magnesite—Greek, ℔ ton 20.00
Manganese—Crude, per unit .23@.28
Oxide, ground, per lb. 2½@6½
Mercuric-Chloride—(*Corrosive Sublimate*) ℔ lb. 70@72
Mineral Wool—℔ lb. 2
Mica—In sheets according to size.
1st quality, ℔ lb. 25@$6.00
Ochre—Yellow, "B. F.," ℔ ton,
f.o.b. mill 30.00
"J. F. L. S.," ℔ h. ex dock 2½
Phosphate Rock—S. Carolina, per ton o. b. Charleston 5.75@7.00
Ground, ex vessel New York 11.00
Canadian Apatite, lump, f. o. b. at Montreal, ℔ ton 16.00
Phosphorus—℔ lb. 70@75
Plumbago—Ceylon, ℔ lb. 4@5
American, ℔ lb. 5@7
Potassium—Cyanide, ℔ lb. .39@40
Bromide, ℔ lb. 33
Chlorate, ℔ lb. 13@10
Carb. ℔ lb. 4.70@5.54
Caustic, ℔ lb 7½@8
Iodide .2.65@2.70
Muriate, ℔ 100 lbs. 1.77½@1.80
Nitrate, refined, ℔ lb. 6@8
Bichromate, ℔ lb 10½@11
Sulphate, ℔ 100 lbs. 2.30@2 35
Yellow Prussiate, ℔ lb. 17½@18
Red Prussiate, ℔ lb. 42@45
Pumice Stone—Select lumps, lb. 1¼
Original cks., ℔ lb. 1¾@2
Powdered, pure, ℔ lb. 2¼@2½
Pyrites—Non-cupreous, p. units 10d
Quartz—Ground, ℔ ton. 14.00@16.00
Rotten Stone—Powdered, ℔ lb. 3¼@3½
Lump, ℔ lb 6@10
Salt—Liverpool, ground ℔ sack. 75@80
Turk's Island, ℔ bush. .25@28
Salt Cake—℔ lb. 60@62½
Saltpeter—Crude, ℔ lb. 5¼@5½
Refined, ℔ lb. 6@8
Soda Ash—Carb., 48 % 100 lb. 2¾
Caustic, 48 % 2¼@2½
Soda Caustic, 60% 3.25@3.35
" 70% 3.00
" 74-76% 2¾
Sal. English, ℔ 100 lbs. 1½@1⅝
Sal. American, ℔ 100 lbs. 90
Nitrate, 100 lbs. 1.70
Strontium—Nitrate ℔ lb. 9@9¼
Sulphur—Roll, ℔ lb. 1¾
Flour, ℔ lb. 2@
Crude Brimstone, 2s., ℔ ton. 19.00@19.29
Crude Brimstone, 3ds, ℔ ton. 18.50@18.70
Talc—Ground French, ℔ lb. 1¼@1½
Domestic, ℔ ton $18@$20
c. i. f. Liverpool, ℔ ton £4 5
Vermillion—American, ℔ lb. 61
English, ℔ lb. 82@85
Vitriol—(Blue), Ordinary, ℔ lb. 5½@5⅝
Extra, ℔ lb. 7
Zinc Oxide—Am., Dry, ℔ lb. 4½
Antwerp, Red Seal, ℔ lb. 6@6½
Paris, Red, Seal, ℔ lb. 6½@7

* Spot.

THE RARER METALS.

Aluminum—(Metallic), ℔ lb.	$2.@$2.50
Sheet, per lb.	2.50
Arsenic—(Metallic), per lb.	.40
Barium—(Metallic), per gram	$4.00
Bismuth—(Metallic), per lb.	2.75
Cadmium—(Metallic), per lb.	1.00
Calcium—(Metallic), per gram	10.00
Cerium—(Metallic), per gram	7.50
Chromium—(Metallic), per gram	1.00
Cobalt—(Metallic), per lb.	6.00
Didymium—(Metallic), per gram	9.00
Erbium—(Metallic), per gram	7.50
Gallium—(Metallic), per gram	140.00
Glucinum—(Metallic) per gram.	12.00
Indium—(Metallic), per gram.	9.00
Iridium—(Metallic), per oz.	7.00
Lanthanum—(Metallic), per gr.	10.00
Lithium—(Metallic), per gram	10.00
Magnesium—Per lb.	4.50
Manganese—Metallic, per lb.	1.10
Chem. pure, per oz.	10.00
Molybdenum—(Metallic), per gm.	.50
Niobium—(Metallic), per gram	5.00
Osmium—(Metallic), per oz	65.00
Palladium—(Metallic), per oz.	35.00
Platinum—(Metallic), per oz.	15.00
Potassium—Metallic, per lb.	28.00
Rhodium—(Metallic), per gram.	5.00
Ruthenium—(Metallic), per gm.	5.50
Rubidium—(Metallic), per gram	2.00
Selenium—(Metallic), per oz.	1.80
Sodium—(Metallic) per lb.	2.50
Strontium—(Metallic), per gm.	.60
Tantallum—(Metallic) per gram	9.00
Telurium—(Metallic) per lb.	5.00
Thallium—(Metallic) per gram.	.25
Titanium—(Metallic) per gram.	2.25
Thorium—(Metallic) per gram.	17.00
Tungsten—(Metallic) per oz.	2.25
Uranium—(Metallic), per lb.	5.00
Vanadium—(Metallic), per gm.	22.00
Yttrium—(Metallic), per gram.	9.00
Zirconium—(Metallic), per oz.	65.00

BUILDING MATERIAL.

Bricks—Pale, ℔ 1,000	3.00@3.25
Jerseys, ℔ 1,000	4.50@5.00
Up Rivers, ℔ 1000	5.00@5.50
Haverstraw seconds, ℔ 1000	5.25@5.50
Haverstraw firsts, ℔ 1,000	5.50@6.00
Fronts, nominal, ℔ 1000.	
Croton	14.00@16.00
Wilmington	20.00@21.00
Philadelphia	@22.00
Trenton	@22.00
Baltimore	
Building Stone—Amherst freestone, ℔ cu. ft.	95@1.00
Brownstone, ℔ cu. ft.	1.00@1.35
Granite, rough, ℔ cu. ft.	45@1.25
Granite, Scotch ℔ cu. ft.	1.00@1.15
Cement—Rosendale, ℔ bbl	.85@1.10
Portland, American, ℔ bbl	2.15@2.45
Portland, foreign, ℔ bbl	2.40@2.50
Portland, " special brands	2.60@2.85
Roman, ℔ bbl.	2.75@2.90
Keene's coarse, ℔ bbl.	4.50@5.50
Keene's fine, ℔ bbl.	7.25@8.50
Slate—Purple and green roofing, ℔ 100 ft.	7.00@7.50
Red roofing, ℔ 100 sq. ft.	12.00
Black, roofing, ℔ 100 sq. ft.	4.25@5.50
Lime—Rockland, common ℔ bbl.	.1.00
Rockland, finishing, ℔ bbl.	1.20
St. John, com. and finish, ℔ bbl.	.90@.95
Glens Falls, com. and fin., ℔ bbl.	.85@1.10
Labor—Ordinary, ℔ day	1.50@2.00
Masons, ℔ day	4.00
Plasterers, ℔ day	4.00
Carpenters, ℔ day	3.50
Plumbers, ℔ day	3.50
Painters, ℔ day	2.50@3.50
Stonesetters, ℔ day	3.50@4.00
Tilelayers, ℔ day	3.50@4.50
Bricklayers, ℔ day	4.00

THE ENGINEERING AND MINING JOURNAL will thank any one who will indicate any other articles which might with advantage be quoted in these tables or who will correct any errors which may be found in these quotations.